National Ignition Facility Monthly Status Report—January 2000

Ed Moses

January 31, 2000

Lawrence Livermore National Laboratory

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NATIONAL IGNITION FACILITY
MONTHLY STATUS REPORT SUMMARY
JANUARY 2000

Project Name:	National Ignition Facility	Building No.	581, 681 at LLNL	
DOE Line Item No.:	96 D - 111	**Project Manager:**	E. I. Moses	925-423-9624 925-423-2612 (fax)
Budget & Reporting No.:	39 DP 02 (PACE) DP 0213 (OPC)	**System Engineer:**	M. L. Spaeth	925-424-4940 925-422-4667 (fax)
Funding Source:	Weapons Stockpile Stewardship – ICF	**Program Sponsor:**	C. J. Keane	301-903-4323
Original Funding Year:	’96 (first quarter)	**Construction Manager:**	V. S. Roberts	925-424-3662 925-423-7588 (fax)
Project Summary Description:	The Project provides for the design, procurement, construction, assembly, installation, and acceptance testing of the National Ignition Facility (NIF), an experimental inertial confinement fusion facility intended to achieve controlled thermonuclear fusion in the laboratory by imploding a small capsule containing a mixture of the hydrogen isotopes deuterium and tritium. The NIF will be constructed at the Lawrence Livermore National Laboratory (LLNL), Livermore, California as determined by the Record of Decision made on December 19, 1996, as a part of the Stockpile Stewardship and Management Programmatic Environmental Impact Statement.			
Project Justification:	The mission of the National Inertial Confinement Fusion (ICF) program is to achieve controlled thermonuclear fusion in the laboratory. This program supports the Department of Energy (DOE) mandate of maintaining nuclear weapons science expertise required for stewardship of the stockpile, testing of nuclear weapons effects, and the development of fusion power by providing a database for inertial fusion ignition. This mission was identified in the NIF Justification of Mission Need, which was endorsed by the Secretary of Energy. Identification of target ignition as the next important step in ICF development for both defense and nondefense applications is consistent with the earlier (1990) recommendation of DOE’s Fusion Policy Advisory Committee, and the National Academy of Sciences Inertial Fusion Review Group. In 1995, the DOE’s Inertial Confinement Fusion Advisory Committee affirmed the program's readiness for ignition experiments. A review by the JASONs in 1996 affirmed the value of the NIF for stockpile stewardship.			
Interfaces with Other Projects	The NIF is a key element of the Stockpile Stewardship Program. It will provide scientific data for secondaries and will complement hydrodynamic tests and material testing for primaries. The NIF will provide data to calibrate ASCI models.			
Risk Management:	The System Engineering group has been organized and chartered to identify and manage risk. Working Groups within this organization include Beampath, Flange to Flange (cleanliness), Alignment, Contamination Control, Laser and Target Area Building (LTAB) lighting, Test Plans, Activation, and Requirements Update.			
Execution & Acquisition Strategy:	The model successfully employed to execute the Conventional Facility will be adapted for the Beampath Infrastructure Systems. This model relies on the services of an Architect Engineer (A/E) for design and a Construction Management firm to assist in managing the complex interfaces during installation and the commissioning of construction contracts. The Acquisition Strategy for laser equipment will focus on the use of integrating contractors to the maximum extent possible to achieve the performance specifications and incorporate technology advances.			

Project Manager's January 2000 Progress Report

Summary Status

Category	Last Period	This Period	Projected Next Period
Cost	Major concern	Major concern	Major concern
Schedule	Major concern	Major concern	Major concern
Technical	Satisfactory	Satisfactory	Satisfactory
Overall Project	Major concern	Major concern	Major concern

NIF Project Manager's Assessment

Overall Project Assessment

Major concern due to schedule and cost.

Safety: On January 13, 2000, a worker received a back injury when a 42-in.-diameter duct fell during installation. He was taken by helicopter to the hospital and released on January 16, 2000. All work in the area was suspended, and the construction contractors went through a thorough safety review before work was started. A DOE occurrence report was filed. An independent LLNL Incident Analysis Team is reviewing the cause of the accident and will report out on March 1. A Project management review team is reviewing construction line management and safety support and will also report out on March 1. Several changes in work planning and site management have been incorporated to increase site safety.

*Technical Status: T*he general status of the technologies underlying the NIF Project remains satisfactory. The issues currently being addressed are (1) cleanliness for installation, assembly, and activation of the laser system by Systems Engineering; (2) laser glass—a second pilot run at one of the two commercial suppliers is ongoing; and (3) operational costs associated with final optics assembly (FOA) optics components—methods are being developed to mitigate 3ω damage and resolve beam rotation issues.

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Schedule: The completion of the Title II design of laser equipment is now approximately 80% complete. The Beampath Infrastructure System is on the critical schedule path. The procurement strategy is being evaluated by commercial construction management and Architectural/ Engineering (A/E) contractors with a report presented to a panel of independent experts, the Beampath Infrastructure System Implementation Review Committee Advisory Group who wrote a set of recommendations for proceeding with this critical path activity. In January, a briefing was given to DOE Oakland (OAK) Field Manager who then arranged briefings for the DOE OAK Procurement organization with the LLNL Procurement organization to review the proposed procurement strategies. The next step is to review the strategy with DOE Headquarters (HQ) procurement.

The construction status of the Conventional Facilities at the end of January is 83% complete and is projected to finish within budget and on schedule.

Cost: The NIF Project Total Project Cost (TPC) is $1.2B. The Project has obligated 73% of the TPC funds. The remaining contingency is $21.8M. Because of schedule delays and projected increases in the design, construction management, assembly, and installation of the system infrastructure, cost growth of the TPC is anticipated and will remain a major concern until the budget rebaseline process is completed.

January Rebaseline Activities

The NIF Laboratory Project performed the following key actions in January to rebaseline the Project before June 1, 2000: (1) prepared the final Rebaseline Plan input; (2) provided the Transition Implementation Plan input; (3) made progress on the rebaseline schedule that forms the basis for the rebaseline cost estimates; (4) implemented contractor activities with the proposed Construction Manager/General Contractor (CM/GC) and A/E to bring in industry to design, fabricate, and assemble the Beampath Infrastructure systems; (5) presented the program and plan for Beampath Infrastructure System Implementation to the DOE OAK Project and Procurement organizations; and (6) continued the major external independent external reviews of the Project.

Rebaseline Planning: The Rebaseline Plan lays out the integrated activities to achieve new procurement strategies to involve industrial partners in the Beampath Infrastructure and the use of contractors to design, manufacture, and assemble laser systems using enforceable bid documents, as is currently done in the Conventional Facilities. The Rebaseline Plan input was updated for DOE, and the option currently being rebaselined is Option IA.

Schedule Rebaseline: Inputs to the rebaseline schedule for the first of two completion options have been put into the Integrated Project Schedule (IPS) Primavera system. Logic and consistency reviews are being performed along with reviews of consistency with budget profiles. This rebaseline schedule forms the bottom-up basis for other completion options and also serves as the basis for the time-phased cost estimate of the NIF completion costs. The schedule was reviewed with DOE HQ at the 30% Review of rebaselining.

Procurement Strategy: LLNL is reviewing with DOE the Beampath Infrastructure Systems to determine the optimum method of involving industry in the design, construction, installation, and commissioning of the infrastructure systems.

Independent Reviews: The reviews by the General Accounting Office (GAO) and Secretary of Energy Advisory Board (SEAB) of independent experts to advise on go-forward deployment strategies and engineering issues are ongoing. The SEAB Task Force interim report was reviewed for factual accuracy and issued.

January Activities Highlights

Site and Conventional Facilities: Work in the LTAB is proceeding near schedule. The OAB final punchlist items are being performed.

Laser/Optics Systems: Phase III of the cleaning/assembly contract was completed, providing an off-site certified clean facility for production amplifier hardware.

Beam Transport Systems: The proposed plan for implementation of the Beampath Infrastructure System was presented to the DOE OAK and LLNL Procurement organizations.

Integrated Computer Control: Completed formal testing of software directed at operating equipment in the Injection Laser System (ILS).

Optics: A record rapid-growth KDP crystal was grown at LLNL that weighed 319 kg and yielded 14 doublers.

Target Experimental System: Target chamber gunite neutron shielding is complete. The rotation of the laser beam in the FOA is a problem that has been identified. Design solutions are being studied and are the subject of an Engineering Change Request (ECR).

Operations Special Equipment: The large-parts preamplifier mechanical cleaner was installed in the OAB.

ES&H and Supporting R&D: The second pilot laser glass production runs began at one of the two laser glass suppliers.

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February Scheduled Activities

The major activities scheduled to occur in February are to: (1) submit final Rebaseline Plan input to DOE; (2) submit final Transition Period Implementation Plan to DOE; (3) provide the 60% rebaseline status to DOE; (4) meet with U.C. Vice President on procurement strategy; (5) incorporate the Beampath Infrastructure System implementation schedule into the IPS; (6) begin Cost Account Plan (CAP) reviews and develop with DOE the performance milestones; (7) carry out switch-yard straight enclosure, first-article inspection at the vendor; and (8) award contract for CSP-17.

WBS 1.1 PROJECT OFFICE

ACTIVITIES

Project Office

The major Project Office activities were to: (1) develop NIF Rebaseline Plan input for DOE, (2) prepare the rebaseline schedule and cost estimates based on the go-forward options, (3) participate in external reviews by U.C., NIF Council, SEAB, and GAO, and (4) provide weekly, monthly, and quarterly status reports.

A 30% review of the status of rebaselining plan activities was given to DOE. Topics included current cost and schedule estimates, transition implementation plan, cost validation, and the Beampath Infrastructure System procurement strategy.

The draft of the Transition Implementation Plan covering the key Project activities from October 1999 to June 1, 2000, until the rebaseline process has been prepared for DOE HQ.

A review with DOE OAK and LLNL Procurement organizations on the procurement strategies for the proposed CM/GC for Beampath Infrastructure System implementation took place, and follow-on actions for DOE HQ reviews are under way.

Several external reviews occurred in January: (1) SEAB Task Force initial report reviewed for factual accuracy and participated in conference call, (2) individual interviews conducted by GAO. (3) NIF Council Planning Meeting held to discuss rebaselining status, external reviews, and restructuring of the NIF Council to support more effectively development of the best plan for completion of the NIF.

Information Systems

Significant progress has been made toward deploying a web-based form for the generation of ECRs. The web-base system will be easier to use, have the ability to be revised, and will walk the user through all mandatory fields.

System Engineering

A significant portion of the effort in System Engineering is toward rebaselining the cost, schedule, and scope of the NIF Project. Some activities include (1) developing the Functional System Description (FSD) that is being used to structure the plans, (2) leading a workshop in developing a consistent and complete set of project milestones, (3) processing proposed changes through the Change Control Boards (CCBs), and (4) developing a methodology for evaluating contingency requirements.

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A briefing was presented to the U.C. Science and Technology Panel on Cleanliness and Contamination Control.

Functional System Description

The System Integration Group developed an FSD for the NIF. The FSD represents all of the NIF in a functional hierarchy. This hierarchy allows the elements at all levels to form operational units that can completely be described starting with requirements through to test plans. The elements can be individually tested and turned over to the next higher level for integration testing. The Project is using this structure to organize the budgets and work so that each FSD organization can be responsible from requirements definition and design through to testing. This FSD should allow cleaner interfaces and provide for better technical oversight of the individual FSD units. This cleaner assignment of technical responsibility will make the commissioning task easier and integration smoother.

Configuration Management, Change Control Actions

There was significant activity within the CCBs during this period. The CCB4 met regularly, reviewing both ECRs and contingency Cost Transfer Requests (CTRs).

The following tables list the actions completed by the Level 4 and Level 3 Change Control Boards in January.

Level 4 Change Control Board Actions

ECR	Title	Resolution	Cost
1345	Simplify Format of NIF Planning System (NPS) Codes for FSD Elements	Approved	0K
1346	Change WBS in 2.9.X and 3.1.X	Approved	0K
1354	Misc Updates to FSD, from Rev. A to Rev B	Approved	0K
1356	ECRs for ISDF Fabrication	Approved	69.3K
1357	ISDF Fabrication ECR	Approved	94.9K
1316	PAMMA utilities under CSP-9	Approved	35.0K

Level 3 Baseline Change Control Board Actions

BCP	Title	Resolution	Date	Cost
001	Unconverted Light Management Using Color Separation Grating	Withdrawn	1/4/00	N/A
003	FOA 3-omega Calorimeter	Approved	1/4/00	0 K
004	SY Gate Valve Beam Block Capability	Approved	1/4/00	567K
006	Change to Air Atmosphere in Amplifier Beam Enclosures	Approved	1/4/00	609K

System Performance, Mission & Risk Analysis

A methodology was developed for estimating the contingency requirement based on the current level of completeness of the scope included in our rebaseline database. Items were identified from the Risk Mitigation study that had not yet been included in the baseline. Additionally, the FSD Milestone Planners were interviewed to identify any scope that was not yet estimated. This information will be evaluated in February to determine whether a piece of scope represents baseline work that will then be included in the plans or held as contingency.

Contamination Control

Considerable discussion has ensued this month concerning the appropriate level of bake-out necessary for elastomers and gaskets for use within the NIF laser cavity. MEL98-006, *High Temperature Bake-out to Remove Volatile Organics* is under final review. MEL99-009, *Gross Cleaning of NIF Components and Structures*, has been issued. This is compilation of six previous MEL documents into a single specification with specific treatments for each type of material that needs gross cleaning.

Problems / Impacts / Corrective Actions

None.

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PROCUREMENTS

A new contract for MTA labor has been placed. The contract moves the design work off site and significantly lowers the hourly rate. Estimated projected savings could reach $2.8M this fiscal year.

VARIANCES

The rebaseline process has not been completed and, therefore, there are currently no variance statements for FY00 cost or schedule.

UPCOMING MAJOR ACTIVITIES

Receive the DOE feedback on the First Quarterly Status Report.

Conduct the First Quarterly review meeting.

Provide the 60% rebaselining review.

Conduct a NIF rebaseline review with the NIF Project Performance Review Group.

Support the finalization and approval of the NIF Rebaseline Plan and the NIF Transition Implementation Plan.

Review technical issues such as 3ω damage with NIF Council subcommittee.

Meet with the U.C. Vice President of Administration to review the proposed procurement strategy.

WBS 1.2 SITE AND CONVENTIONAL FACILITIES

ACTIVITIES

Conventional Facilities work reached 83% completion in January, compared with 81.7% at the end of December. To date, $173.1M in construction contracts has been placed for the NIF Conventional Facilities construction, and work in place is approximately $142.2M.

Progress in the Laser Building (LB) included the placement of the concrete foundation for the Visitor Center. Work in Laser Bay 1 included the activation of permanent lighting and the continuation of wall framing and drywall installation. Work in Laser Bay 2 included the finish painting of pedestals, the continuation of wall framing and drywall installation, and completion of ceiling and light installation along the west end. Work in the Mezzanine 2 and 3 involved the installation of lighting controls and the pipefitting for the air handling units in preparation for start-up. Work in the Core Control Area surrounding the Control Room and PAMMA included the installation of metal stud walls with window frames, electrical rough-in, ductwork, ceiling framing, and seismic bracing. The installation of the roof membrane for the OAB Corridor, HVAC chase/elevator 2, and the Laser Bay 1 and 2 roof at line 10 was completed. Work at the Central Plant continued with the execution of remaining punchlist repairs, while production of chilled water for the OAB continued. Site work included the installation of electrical manholes, a communication manhole, and temporary gravel paving surrounding the Target Building to accommodate construction traffic for safe and efficient work during the wet weather season.

Progress in the Target Building (TB) included the installation of the Target Bay elevated slab at 87.00-ft elevation, first segment of Target Bay cylinder wall on J line at 69.75/84.50-ft elevations, Target Bay radius walls at 69.75/84.50-ft elevations, pipe support welding and truss at –29.50-ft elevation, and mechanical piping and electrical conduits on –21.75/–3.5-ft elevations. Pitt-Des Moines (PDM) completed the second layer of gunite on the Target Chamber. The collimators were installed at –33.50-ft elevation. The work in Switchyard (SY) 2 included the installation of surface mounted conduit and electrical rough-in on walls, installation of ductwork and sprinkler piping on the platform, bridge crane, and rails, and painting of the area above the ceiling. In SY1, two precast beams were placed, and the shoring for the labyrinth structure was erected. Work in the Diagnostic Building included the installation of metal stud framing, drywall, HVAC ductwork, electrical rough-in, toilet room piping, and exterior siding. Work at the elevator tower

included the installation of the girt and siding, stairs, machine room slab, and support beams.

Work in the OAB continued with the execution of final punchlist repairs, door operator adjustments, touch-up painting of exterior siding and gutters, and raised-floor rework.

PROBLEMS / IMPACTS / CORRECTIVE ACTIONS

Congestion on the west side of the site will continue to be the major burden through the winter. Four contractors including Hensel Phelps Construction Corporation (HPCC), Nielsen Dillingham Builders, Inc. (NDBI), Rigging International, and PDM, are performing various construction activities in the same vicinity. Maintaining access to the building for workers and materials, at the same time as underground utilities are being installed to meet completion dates this winter, continues to require a great deal of coordination.

Site preparation for wet weather construction needs to continue in February to allow for safe and efficient work to occur this winter. Efforts to enclose the building and winterize the site, including the sealing of roof openings at the OAB corridor and the LB-TB and SY interfaces, will continue to be a challenge.

PDM's duration within the Target Bay may impact NDBI's ability to meet the milestone of having the TB commissioned and turned over to Special Equipment by July 31, 2000.

The current location of the ringer crane and Rigging International's request to use the crane beyond January 31, 2000, may impact CSP-9's completion date for electrical/communication utilities outside SY1. This in turn could affect the date for permanent power to SY2.

PROCUREMENTS

None Planned.

VARIANCES

The rebaseline process has not been completed and, therefore, there are currently no variance statements for FY00 cost or schedule.

UPCOMING MAJOR ACTIVITIES

The milestone OAB Complete (Cleaned & Commissioned), CF555221, originally planned for August 1999, is projected to complete in early March 2000, due to the execution of a very extensive punchlist of repairs and the submission of final as-built documents.

The installation of formwork and placement of rebar for the Target Bay roof slab is projected to be completed in early March, and the placement of concrete for the roof slab will commence in mid-March.

The installation of SY2 roofing and insulation work will continue.

The installation of steel for the lower levels of the SY1 spaceframe is projected to commence in early February.

The commissioning and certification of Control Rooms within the Laser Bay is projected to commence in late March or early April.

The erection of structural steel framing for the Visitor Center is projected to commence in late March or early April.

The Laser Bay 1 activities are projected to continue with the installation of the plenum wall in the lower half and the commencement of the finish painting of concrete pedestals.

The Laser Bay 2 work is projected to concentrate on the completion of drywall installation and the finish painting of concrete pedestals.

The installation of HVAC ductwork will commence within Capacitor Bays 3 and 4.

The installation of controls and wiring for the HVAC equipment on Mezzanines 2 and 3 will continue.

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WBS 1.3 LASER SYSTEMS

ACTIVITIES

An important activity this month was implementation of the FSD structure as part of the NIF rebaseline planning effort. This is a significant task, but it is improving the quality and completeness of the plans.

Optical Pulse Generation System

The first-article fiber amplifier chassis in the process light path of the Master Oscillator Room (MOR) was completed and deployed in the MOR integrated systems test facility racks in building 381. Tests are currently under way to verify that it meets its performance and stability requirements.

Highland Technology provided a demonstration of the amplitude modulator chassis that they are building; this chassis is designed to produce the required temporal pulse shapes on the NIF laser beams. All the key types of boards were installed for the demonstration. The demonstration showed that some design modifications will be necessary to meet all performance requirements. Highland expects to deliver all four units by the end of March.

Spectral transmission measurements on the fiber amplifier chassis and its components indicate that the amplitude modulation, induced from Stimulated Brillouin Scattering and Smoothing by Spectral Dispersion phase modulation, will be too high. The measurements indicate that the isolator and 1×5 splitter cause unacceptably large modulation, due to waveplates in each. Design modifications are being considered to correct this problem.

Preparation of the documentation for the Pre-Amplifier Module (PAM) first-article procurement package continued. A committee of experts reviewed the package and offered some suggestions for improvement. Overall, they recommended proceeding with the procurement.

The fault testing on the new power conditioning unit (PCU) for the PAM was conducted successfully by Maxwell (90% of testing). The redesigned diode-pumped regenerative amplifier head was assembled and installed in the prototype PAM.

Independent testing of the MOR and PAM software was conducted this month. Front-end processor (FEP), graphical user interface (GUI), and/or embedded controller software to control the MOR devices was developed or revised.

Assembly and installation drawings were created, and seismic and structural analysis were completed for the Pre-Amplifier Support Structure (PASS) to be installed in B381 for risk mitigation studies of the Pre-Amplifier Beam Transport System (PABTS). A working group was convened to develop the procurement strategy for the PABTS opto-mechanical components (approximately 2500 optics).

Amplifier System

The amplifier enclosure (frame assembly unit [FAU] bus) assembly stand was load tested, and the process of aligning the rails upon which the buses will be assembled began. The activation of the software and hardware for inserting alignment targets in the amplifier also began this month.

Amplifier Power Conditioning System

The modifications to the design of the power conditioning system (PCS) modules to allow transportability were completed and presented by Maxwell-Physics International.

The first transmittal of documents to CSP-14b was completed for the power conditioning infrastructure hardware (e.g., cable ramps, stairs, and handrails). A safety Integrated Worksheet (IWS) for the B391 test stand construction was approved. Initial design of the FAU mounting hardware for the end-to-end test of the amplifier electrical system was completed, and detailed design is progressing.

The first operating power conditioning FEP was tested and demonstrated. This version of the FEP demonstrated the control and operation of a single dump switch; as such, it represents a “vertical slice” of the controls architecture.

Problems / Impacts / Corrective Actions

Nonvolatile residue and particle-generation tests have been completed on a full-scale amplifier FAU casting (reported previously). Plans to eliminate porosity in the FAU castings using a hot-isostatic-press (HIP) are on hold indefinitely. The engineering team has completed its evaluation and is writing a final report for concurrence by Systems Engineering. This will continue to be reported as a problem until concurrence is obtained.

Procurements

Procurement readiness reviews were conducted on the build-to-print procurement of the four Ultra-Trigger fiber amplifier chassis. A preliminary bidders list of ten vendors was developed for the RFQ, which is expected to be released in March.

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Representatives from LLNL witnessed testing of the first-article breadboards that will be installed on the PASS; these are being manufactured by Kinetic Systems. Problems with mechanical sealing of the breadboard holes were identified, and the vendor is taking action to remedy the problems. To verify compliance with the sealed holes specification, 100% inspection will be conducted on the next set of breadboards.

The first-article FAU was shipped from GTC in Cincinnati and will be installed on the rails and will be used to verify the cleaning procedure at Astro-Pak next month.

Phase III of the Astro-Pak cleaning/assembly contract for the FAUs was completed, providing a certified clean-room facility and handling equipment for the production amplifier hardware. Demonstration of the capability to reach the required cleanliness levels will begin next month.

Blastshield frames and glass for the first bundle of NIF amplifiers were received on schedule. Procurement documentation and review were completed for the blastshield transport boxes needed to safely move the blastshield assemblies from the optics production area to the amplifier assembly area.

VARIANCES

The rebaseline process has not been completed and, therefore, there are currently no variance statements for FY00 cost or schedule.

UPCOMING MAJOR ACTIVITIES

Continue cost estimating, detail budget planning, development of CAPs, and overall project rebaseline planning.

Finalize preparations to send PAM first-article contract out to bid.

Align the FAU assembly stand rails in preparation for a dirty test assembly of the amplifier.

Conduct vendor evaluations for the PCS first-article and production contract.

Prepare Request for Proposal (RFP) for first articles.

WBS 1.4 BEAM TRANSPORT SYSTEMS

ACTIVITIES

Spatial Filter Vessels / Enclosures

Spatial Filters: Three Cavity Spatial Filter (CSF) center vessels were received from March Metal Manufacturing in January, completing that order with all four vessels delivered. No new Transport Spatial Filter (TSF) center vessels or Spatial Filter end vessels were received. Final deliveries on the end and TSF center vessels are expected in March 2000. At the end of January, 188 of 240 circular beam tube assemblies had been received, and delivery completion is expected in early March. Seventy-five of 192 rectangular beam tubes were on hand at month's end with delivery completion expected in mid-April.

Laser Bay Interstage Enclosures (LBIE): The first two SF3 Interstage LRU Docking Frames satisfied dimensional, leak check, and gross cleaning requirements and were received in early January. They were inspected as part of the CSP-12 preassembly activities. Two more are expected in late February, but final delivery of the balance of 12 is not expected before August 1. This is a two-month slip in the last six weeks. The rupture panel Government-Furnished Equipment (GFE) specification and reference drawing were completed, and four fabricators were contacted for a verification estimate. Work was begun on the selection of material and design for the switchyard wall dielectric break.

Switchyard (SY) Enclosures: Yuba City Steel Products Co. has scheduled the first-article inspection of the SY straight enclosures for mid-February. This is one week later than the original schedule. Redesign of the enclosure elbows to accommodate a bellows on the 45^{o} face is planned for review and release to bid in early April. The specification for the first-article bellows assembly (covering LB, SY, and TB bellows) was completed and released in January. The Request for Quote (RFQ) is planned for release in February. The vendor interaction, fabrication, and testing of these first articles is required to move the remaining bellows designs forward to meet all design and project requirements.

Ghost Mitigation: Following a design review of the ghost mitigation hardware, some of the drawings and the specification are having comments incorporated. An RFQ package for the remaining beam tube 'megaphone-style' ghost mitigation hardware is expected to be issued

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in mid-February. Installation of the spatial filter ghost mitigation towers is being added to the CSP-16 Scope of Work documents.

Roving Mirror Diagnostic Enclosure (RMDE), Optic Mounts, and Gate Valve: Roving Mirror optic mount stability analyses continued. Analyses are not final since the LRU (part of the Roving Mirror Assembly [RMA] system) design and properties are not yet available to incorporate into a complete evaluation. Analyses are also being conducted to verify the preliminary stability performance of an alternate mounting structure design. The alternate design, by virtue of the fabrication techniques involved, may result in significant cost savings. The evolving RMA and LRU design may impose minor design changes to the KMS interface design.

Design review comments are being incorporated into the Gate Valve design. Additional design effort addresses features to meet the complete design requirements including manufacturability, installation, and usage mode issues. ECR 1119 incorporates a beam block function into the Gate Valve along with remote operation capability.

Subassembly and Preparations of Government-Furnished Equipment (GFE): Performance of CSP-12 preinstallation work continued on spatial filter vessels in preparation for precision cleaning. Three end vessels were aligned, surveyed, and precision cleaned during January, bringing the total to eleven. Work began on the CSF center vessels to prepare them for precision cleaning. The two ISDF units received were inspected, and planning is underway for a fit-up test with one of the uncleaned end vessels.

Auxiliary Subsystems

Laser Bay Utilities and Beampath Construction Package: The Parsons contract has been released, and a list of the Parsons and LLNL deliverables has been developed. This covers the CSP-14, 15, and 18 scope of work. Work continued on completion and checking of industrial controls wiring diagrams and rack layout drawings plus correction of the cable schedule, instrument list, and wiring diagrams. To efficiently route and land the LRU cables, simplified representations of the LRU models are being generated by the Integration Group/LRU owners and inserted into the Intergraph 3D model. This will allow Parsons to develop the required electrical plans and details directly from their Intergraph system. Systems Engineering has developed the system requirements to give to Jacobs Engineering for incorporation into the Auxiliary Systems piping and instrumentation diagrams (P&IDs). Changes to these systems identified by the review process will be incorporated into the P&IDs before design activities on these systems are restarted.

Progress continued for the beampath installation packages CSP-16 and CSP-19. For CSP-13, 100% design documentation was completed and issued for bid. For CSP-16 and CSP-19, the 65% design documentation was completed, the package was issued for review, and comment validation is in progress. The design documentation is progressing on schedule.

Support Structures

Switchyard Structures: The main structure for SY2 has been installed. The SY1 and SY2 Pro-E models are being updated to reflect the incorporation of Requests for Information (RFIs) and fabrication changes. Parsons continues to receive updates to correctly locate utilities and equipment for the CSPs. SY1 fabrication is proceeding at Coast-AGRA. Approximately 600 shop drawings were reviewed in January.

Laser Bay Structures: Concrete placement is complete for all of the Laser Bay 1 & 2 concrete pedestals. The location of the embedded plates has been surveyed by the contractor, and the results are acceptable, although many are somewhat out of tolerance. The penetrations at LB2 TSF center vessel concrete pedestal have been surveyed by the contractor, and the results are being reviewed. LB2 concrete pedestals are being surface finished with a gypsum material prior to painting. Approximately 60% of LB2 pedestals have been painted.

All four periscope cluster structural support units have been delivered. Changes to the bottom enclosure plates for the laser mirror (LM)2 and plasma electrode Pockels cell (PEPC) have been requested in an ECR by Transport and Handling. The drawings for these changes were completed and forwarded to Martinez & Turek for fabrication. This change does not effect the construction schedule.

ATT Metrology's survey of the location of the kinematic mount sleeves and other machined areas in the LM1 support structures at Olympic Tool revealed that many of the sleeves and other machined holes are not located within tolerance. The survey data has being reviewed, and Units 1, 2, and 3 have been accepted and delivered. Unit 4 was shipped in mid-December prior to being accepted. The Olympic Tool inspection data on Unit 4 is inconsistent with that from ATT Metrology. ATT Metrology has been contacted and is forwarding a revised report. This does not effect the construction schedule.

There is an ongoing review of the aluminum flame-sprayed surfaces of both the periscope and the LM1. The aluminum surface is quite porous, and high-pressure washing of these surfaces continues to dislodge aluminum particles even after repeated washings. An ECR to clad the interior flame-sprayed surfaces with stainless-steel sheet was

presented to the Level 4 and Level 3 CCBs in mid-January. Following their approval, detailed design was begun. A formal design review is scheduled for mid-February. Vendor pre-bid qualification is being conducted in parallel with Procurement. Tentative schedules and installation sequences were developed with the CSP-13 design staff to minimize schedule impacts on the installation. The target Request for Bid (RFB) date for the contract is March 1.

Process Equipment, the periscope-bottom enclosure-plate contractor, submitted schedule, heat treatment procedure, weld qualification procedures, welder certifications, dimensional inspection procedure, ultrasonic test procedures, and material test reports to LLNL. All documents have been approved. Fabrication of the periscope-bottom enclosure plates has started. This fabrication is on schedule.

Hogan Manufacturing is progressing on the change order for the fabrication of the ILS Modifications to the PASS. Thirty modules have been delivered. The remaining eighteen are scheduled for staggered delivery to be completed by mid-February. This fabrication is on schedule.

Optical Mounts

Progress continued on design completion and procurement of the structure mounted hardware, which is the interface between structural frames/beam enclosures in the laser bays, switchyards and target area and the optical mount LRUs.

First-article inspections were completed and approved for three parts for the LM1 kinematic mounts being fabricated by Liberty Machine.

The procurement package for the LM2 and LM3 kinematic mounts for CSP-16, which was scheduled to go out to bid in January, has been delayed into February. All documentation required for this procurement have been completed and is being reviewed. Minor issues regarding the organization of this documentation vis-à-vis the LLNL requisition system and the NIF CM and parts tracking system are being worked. The expected delivery date for this hardware is still consistent with the CSP-16 schedule.

The design was completed for the LM2 and LM3 electrical panels (needed for CSP-16). The procurement package is being prepared, and a procurement review has been scheduled for mid-February.

Encouraging progress was made on the mirror mount layout work necessitated by the beam rotation problem and final optics redesign. Additional engineering and design personnel were assigned to this work in January. The location of LM6–8 LRUs are being reviewed

with respect to the optical design configuration of the final optics assembly. The new configuration causes the LM8 LRUs to be in a 1 × 2 array, which is similar to the LM6 and LM7 LRU designs. This improves the design in several respects.

PROBLEMS / IMPACTS / CORRECTIVE ACTIONS

Both remaining Spatial Filter Vessel fabricators continued to slip their schedules by a few weeks. The TSF center vessel vendor (STADCO) has placed the job under new management and is in contact with the technical representative at least twice a week. Delivery of the final units is still expected by the end of March. The delay is not expected to impact construction installation progress, but it will require additional staffing to perform vessel hardware installations and cleaning in a few months.

RMA interface changes are impacting the Roving Mirror Diagnostic Enclosure (RMDE) design. Key aspects of RMA design, construction requirements, and installation affecting the RMDE need to be completed and incorporated into CSP-19.

The first spatial filter end vessel showed signs of free-iron contamination after gross cleaning. The concern was the evolution of loose rust on the interior beamline surfaces over the life of the vessel that could migrate and damage optics. Consultation with LLNL and off-site corrosion experts indicated that surface contamination of stainless steel during fabrication is a frequent occurrence in shops that work with both mild steel and stainless steel. The consultants recommend that stainless steel parts produced under these conditions have a surface acid etch, similar to that described in ASTM A380, performed prior to precision cleaning. Identification of beamline components and LRUs affected by this problem is under way to support an ECR for funding to perform the required surface treatment. The ECR is expected to be presented to the CCB in February. This was delayed due to work on the Periscope/LM1 cladding ECR.

Last quarter, two ECRs were prepared for diagnostic pick-off modifications to the TSF4 connecting tubes (ECR 865) and the SF4 circular beam tubes (ECR 1254). When reviewed by the CCB in early December, an alternate optical solution was believed to be available that would not require beam tube modifications. In late December it appeared that such a solution might not be workable, and that it may be necessary to resubmit these ECRs and proceed with the modifications. This month, analysis of the beam tubes indicated that the problematic beam clipping will not occur, and that no modification to the tubes will be required.

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Approval of optical design changes (i.e., wedged lens) and associated requirement/specification changes are needed for engineering activity to proceed for LM6–8 structure-mounted hardware and LRU designs.

See beam rotation problem described in WBS 1.8. Optical design changes, the mirror layout, and associated requirements/specifications changes are occurring. The redesign and engineering activity for LM6-8 LRUs is proceeding. This paces the design of the structure-mounted hardware for these LRUs.

PROCUREMENTS

A $109K procurement was placed with Hyspan for fabrication of Spatial Filter Kinematic Mount Bellows assemblies.

All GFE equipment (i.e., long lead-time electrical connectors) required in the LM1 electrical panels contract (being fabricated by Gregory Associates) were delivered in January. First-article inspection of cable assemblies were conducted and approved. Several first-article mechanical parts were inspected and found to be out of tolerance and were rejected. These parts will be refabricated and reinspected in early February.

The delivery schedule for the LM1 kinematic mounts has been delayed and will not be completed until the end of March; this new date is within the schedule float and not expected to delay CSP-12 activities. Vendor bids were received for the LM1 utility panel and the pneumatic mount actuators for LM1-3. After review of bids and a vendor site visit, the fabrication contract was awarded to Electrol Manufacturing Company. (This hardware is required for CSP-12 and 16.) Initial GFE equipment (i.e., cleaned pneumatic cylinders) required in the contract were delivered in January.

VARIANCES

The rebaseline process has not been completed, and therefore, there are currently no variance statements for FY00 cost or schedule.

UPCOMING MAJOR ACTIVITIES

Continue work for completion of Title II GFE and CSP designs and place orders for most of the remaining beampath systems GFE under this WBS.

Continue deliveries and construction of vessels, structures, and beam tubes.

Start GFE preparation activities to complete the SF end and center vessel assembly and cleaning.

Install SF tower support table kinematic actuators to support construction.

Complete delivery of the PAM and PABST support structures (PASS);.

Inspect the SY first-article enclosure.

Receive initial delivery of hardware for the LM1 kinematic mounts for CSP-12 in February.

Receive delivery of LM1 electrical panel first articles for test and evaluation.

Complete the LM2 and LM3 kinematic mount hardware procurement package and release an RFP.

Plan a procurement review for the SF LRU kinematic locator gas covers for CSP-16 for February.

Continue transport mirror mount LRU redesign—a preliminary redesign will be completed over the next four weeks.

Release for bid in February the following items:

- TSF extension/injection tubes with an estimated value of $300K.
- Ghost mitigation hardware for beam tubes with an estimated value of $350K.

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WBS 1.5 INTEGRATED COMPUTER CONTROL

ACTIVITIES

Flashlight Software Release Testing: Formal testing of the Flashlight software release was completed. Flashlight is the first of three software releases planned for the first half of fiscal year 2000 that are directed at operating integrated equipment in the master oscillator, input sensor, and preamplifier in an upcoming major system test. A total of 84 test incidents were documented, including 55 software defects (65%) and 13 requirements issues (15%). The remaining test incidents were primarily attributed to the test hardware and procedures. Software defects were logged as software change requests to be resolved by the development team; high priority defects will be re-tested in the next release. The last two formal tests (Flashlight and Penlight) have resulted in a defect rate of about 1 defect per thousand source lines of code.

Software Configuration Management: Quality control and configuration management of NIF software is handled separately from other NIF documentation as prescribed under subordinate plans. Two near-term goals are to manage the deployment of test software into testbeds and laboratories and to foster the steady improvement of software quality and the development process.

A review of the Ancillary Software Configuration Management Plan was conducted to ascertain applicability to industrial control systems; minor revisions will be made to accommodate special requirements. To augment the Apex tool used to manage the supervisor and FEP software development, a specialized configuration management tool for programmable logic controller software and control interfaces was selected to be purchased in the August 2000 time frame.

The Software CCB manages the assignment and resolution of numerous change requests that do not trigger higher-level CCB actions. Change requests are managed with the help of a tracking tool and database. The Flashlight test triggered 56 change requests for FEPs, 23 for GUIs, 1 for supervisors, and 8 for frameworks.

Code walkthrough is the inspection of selected portions of NIF software with the goal of finding defects and improving quality before formal testing and deployment. Since walkthrough activities began 13 months ago, 19 product components were inspected (some twice), and 270 defects were reported. Recent analysis of the inspection process shows that a single inspector can examine about 220 source lines of code per hour, and on average discovers three defects per hour. Code walkthroughs will continue to be used on an audit basis.

Supervisory Software: Development continued on software for controlling the preamplifier multi-pass amplifier and regenerative amplifier. Graphical user interfaces for broad-view status displays and control panels were built. Software for the power sensor was implemented, integrated, and unit tested with the digitizer software in the laser power FEP. Database tables, data entry forms, and interface software was added to support configuration of the preamplifier supervisor and FEP, and the master oscillator and alignment controls FEPs. Integration and unit testing has begun.

A GUI was developed to start, stop, and view the status of all processes running on control system computers. This was integrated and tested with the system manager server, which coordinates control system distributed processes. Software rework was completed to ensure that only one server runs, which has been a cause of indeterminate behavior in past releases.

A Supervisory Shot Life Cycle overview and programming guide were created that describe the implementation of shot life cycle software in each of the supervisory subsystems.

Automated Software Testing Tool: In-depth evaluation of the leading automated test tool was initiated in January 2000 to assess capabilities for testing the NIF distributed control system. The automatic alignment test that was performed manually for the Flashlight release was selected for representative evaluation. The test team is preparing automated test scripts with assistance from the LLNL Software Technology Center.

Industrial Controls: Wiring diagrams (about 550 sheets) for the utility controls were completed and delivered to Parsons Engineering as one of the deliverables for the new design contract. The package includes controls for the amplifier cooling system, argon system, spatial filter vacuum system, target area vacuum system, and the tempered water system. About 1000 safety interlock system interconnection drawing sheets were also completed and delivered. These drawings will be back-checked during February 2000, with the final submission occurring in March 2000.

A vacuum system controls working group was formed to resolve design issues between the target area and spatial filter vacuum systems. This group will also ensure commonality in the controls and documentation.

Video Distribution System: Hardware was recently added to support the portable back reflection sensor in the PABTS and the 3ω camera in

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the FOA. Cable design documents including specifications and routing requirements were submitted for inclusion in the CSP-14 package.

System Engineering: About 2000 primary software requirements (updated last quarter) are being reformatted into a database that will assign requirements to the appropriate functional system description elements. The database will improve visibility of requirements and associated test procedures for review by functional system managers.

PROBLEMS / IMPACTS / CORRECTIVE ACTIONS

Additional engineering staff requirements for fiscal year 2000 (nine positions) have been identified for supervisor software, FEP software, optics damage inspection, and industrial controls engineering.

PROCUREMENTS

Timing measurement system: Prior to shipping, acceptance testing of all master timing hardware was successfully completed at the Timing Solutions Corporation facility January 18–19, 2000 with NIF personnel in attendance.

Timing delay generators: A procurement strategy for delay generators has been tentatively agreed upon with the vendor, Highland Technology. The strategy calls for production to be divided into four phases over the next four years, with funding for each phase committed in the year of purchase. The first phase will manufacture 21 delay generators, procure the entire lot of critical parts needed for full NIF deployment, and fund nonrecurring engineering charges. This agreement will achieve quantity discount for the generators without obligating the entire lot.

VARIANCES

The rebaseline process has not been completed, and therefore, there are currently no variance statements for cost or schedule.

UPCOMING MAJOR ACTIVITIES

The master timing equipment will be delivered in February 2000.

Construction of enhanced software intended for the preamplifier integrated system test has started and is scheduled for a major release in April 2000.

A minor release will be delivered in February 2000.

WBS 1.6 OPTICAL COMPONENTS

ACTIVITIES

KDP and DKDP Crystals

A record-breaking rapid-growth KDP crystal was grown at LLNL, weighing 319 kg and yielding an additional 14 doublers. This gives approximately half the KDP needed for the NIF. One rapid-growth production run was begun at a vendor facility, and two others passed the 75% completion mark. Eight of 14 conventional-growth DKDP tripler crystals have been planted at Cleveland Crystals Inc., which will supply the first half of the NIF. A reduced temperature rapid growth DKDP run involving continuous solution exchange with a supplemental growth solution tank was begun at LLNL to test the effect of lower growth temperatures on 3ω damage threshold.

Optical Pulse Generation and Injection System Optics

The problem identified in December with the placement of the injection window has been diagnosed, and a workaround is in process. An ECR has been approved, and a new window drawing has been made with an increased clear aperture to accommodate the error in placement, which is being reviewed by the optics procurement group. No cost impact is expected.

The new optical configuration for the FOA was released using a wedged plano-convex lens. The configuration requires refinement to accommodate mechanical mounting constraints and ghost management. Analysis of stray light in the FOA will be completed once the design is mature.

Nominal placement of the mirrors to accommodate the wedged lens design without inducing beam rotation has been developed in ProE. The ProE model is being updated to correct minor errors and to generate the new mirror coordinates for all 192 beams. Completion is expected in February. The alignment plan is being developed separately and will require an update of the clear-aperture analysis of the mirrors for the new beam layout and alignment plan.

The plan to control small optics materials was completed. This plan describes responsibilities and procedures and includes the flow from suppliers through receiving, test, and storage prior to installation in the NIF. This material includes individual optics and integrated packages along with storage cases and witness samples.

The plan to sample optics for inspection and test was defined in *PAM Quality Assurance and Metrology Requirements for Optical Compo-*

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nents (NIF-0034082). This approach will be the basis applied to other integrated packages as well as individual components.

QA and Damage Testing

Setup is complete for the large optics metrology operations in B391.

PROBLEMS / IMPACTS / CORRECTIVE ACTION

Work is under way to correct the beam rotation problem under the wedged lens study ECR.

The problem identified in December with the placement of the injection window has been diagnosed, and a workaround is in process.

PROCUREMENTS

No major procurements were made in January.

VARIANCES

The rebaseline process has not been completed, and therefore, there are currently no variance statements for FY00 cost or schedule.

UPCOMING MAJOR ACTIVITIES

A final arrangement of the mirrors to implement the wedged lens design to correct the beam rotation problem will be released in February.

WBS 1.7 LASER CONTROL

ACTIVITIES

Release of design drawings under CM continues to be a concern (see Problems/Impacts/Corrective Actions). The design drawing status for WBS 1.7 is 3207 drawings required, with 1859 completed in CM (58%). The most significant work on drawings still remains in the Precision Diagnostics System (PDS) and the Roving Mirror Diagnostic Assembly (RMDA).

An important activity this month was implementation of the FSD structure as part of the NIF rebaseline planning effort. This is a tremendous amount of work, but it is improving the quality and completeness of the plans.

Alignment Systems

The design package for the TSF Alignment Platform Assembly is close to completion. Work this month included ECRs related to the platform drawing and fiber launch. The assembly drawings were checked and are now ready for submittal to CM. For the CSF platform, drawings of the illuminator package were completed, and an ECR related to the platform itself generated.

Software for testing repeatability of the tower platform pinhole wheel positioning is about 80% complete. Two checks will be made to determine repeatability. One will track motor step count variance associated with each position. The second will illuminate the pinhole with a laser, capture and image process the pinhole for center of mass, then track the variance of this position. Approximately 50 fiber sources will be required to perform various calibrations and tests on the tower test stand. Approximately 46 cameras will be used in performing tests associated with the tower test stand, and work is in progress on changes to the camera interface prototype unit to correct a sync signal loading issue.

Beam Diagnostics

The change to the wedged lens design in the IOM was assessed for the PDS. The PDS will accommodate this change by selecting a single, fixed position for PM7 and by designing a new 1, 2, and 3ω energy and power diagnostic table within the target plane diagnostic. This closes a previously reported problem.

Cable From-To tables for the power sensor diagnostic, portable sensor, and pulse synchronization systems are 95% complete; the remaining effort is to define the UV/IR fiber-to-photodiode couplers, UV/IR cassettes and chassis, and UV fiber configuration in the diagnostic mezza-

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nines racks. All infrastructure From-To cable tables for WBS 1.7.2.2.4, WBS 1.7.2.2.5, and WBS 1.7.2.3.6 were placed under CM and submitted for inclusion in the CSP with Parsons.

Definition of 3ω fiber and cable tray routing from the target bay to the diagnostic mezzanines is 90% complete. All 96 fiber paths have been routed, and all fiber route lengths in each cluster have been determined. Discussions with Parsons to route the UV fiber from the FOA into the mezzanine and racks have begun.

Wavefront Control Systems

A 5000-shot flashlamp exposure test was completed on three deformable mirror cup-to-post epoxy joints. The flashlamp light damaged the stainless-steel screen used to attenuate the flashlamp light. This damage caused some areas of the test samples to be exposed to the full fluence. It also caused a higher-than-expected epoxy bulk temperature rise during the latter parts of the test. Creep in these samples varied from between 0.35 and 0.5 µm. Five thousand shots represents about 20% of the expected number of shots on the NIF; thus, the creep observed extrapolates to between 1.75 and 2.5 µm, which exceeds the 1-µm budget. At this rate of creep on NIF, DMs will begin to fall below their required stroke after about 10 years of service. At this time, it is not known if the observed creep is due to prompt heating (a NIF issue) or due to bulk heating caused by the damaged screen (not a NIF issue). The 5000-shot test will be repeated as a background effort.

Problems / Impacts / Corrective Actions

Release of design drawings under CM continues to be a problem. Weekly review of status, staffing, and priorities are carried out to insure the highest priority drawings are completed on a schedule consistent with the needs of the project. Drawing production (as measured by drawings released) has declined over the past two months. A number of factors are involved: key engineers involvement in rebaselining, reduction in number of designers working on site as MTA contractors, designer office moves, and CAD system failures (e.g., disk crashes). These issues are being worked with Engineering Services to assign designer resources commensurate with project priorities.

Procurements

The first shipment (12 sets) of CSF tower kinematic mounts was shipped at the end of January (contract value is $216K). The next set is due in March as planned (6 sets each the TSF towers).

The first-article deformable mirror actuators were received from Xinetics (contract value is $1.3M). A contract for lapping deformable

mirrors was awarded; the contract was amended to included options for all phases of NIF construction. A pilot contract for stainless-steel reaction blocks was also awarded.

An amendment to the Russian fiber contract (B503973) was issued and is awaiting signature by Vavilov. This modification will delay delivery of the fibers until May, when they will be delivered mounted on spools to be provided by LLNL. This raises the value of this contract to approximately $1M and was required due to the move of the 3ω diagnostics to the target area. The Baseline Change Proposal 99-009 was previously approved by the Level 3 Baseline CCB on August 25, 1999.

VARIANCES

The rebaseline process has not been completed, and therefore, there are currently no variance statements for FY00 cost or schedule.

UPCOMING MAJOR ACTIVITIES

Continue cost estimating, detail budget planning, development of CAPs, and overall project rebaseline planning.

Complete the parts of PDS and RMDA designs needed for the 100% CSP-19 Review, currently scheduled for April.

Support testing associated with FEIST, which will involve using the prototype input sensor.

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WBS 1.8 TARGET EXPERIMENTAL SYSTEM

ACTIVITIES

Target Chamber

The application of the neutron/gamma-ray gunite shield has been completed. A minimum of 400 mm (16 inches) of 0.14% borated concrete was applied in two layers. Each layer had a rebar grid. The gunite was troweled and hand rubbed to obtain a smooth finish. The tensile values of the concrete are in the 3500–4000 psi range. This is higher than the 3000 psi that was initially obtained in the small batch tests but is consistent with an 8-sack concrete mixture. After a few weeks cure, the gunite will be sealed and painted with an epoxy paint (brushed and rolled). This will take place in early February. The currently planned color is “safety blue.”

Preparations for the rate-of-rise test on the chamber have started. The purpose of this test is to confirm that no leaks have opened up in the welds during the Gunite process. The post-gunite rate of rise will be compared to the pre-gunite rate of rise.

Discussions are being held to determine the best time to map the chamber and machine the FOA spacers. If the overall NIF schedule permits, a later mapping and machining could be done when the building reaches thermal equilibrium. This would produce more meaningful measurements and better accuracy on the FOA spacer dimensions.

First Wall: The design of the first-wall panels has been completed. Detailed design of the first-wall flashing is about 80% complete. The installation of the panels is being validated using the Pro-E modeling software to insure proper spacing of the panels. The fabrication of the target positioner booms is behind schedule. The manufacturer has run into slight delays, but they are not expected to affect the schedule. Performance testing of the booms will start in February. The detailed mechanical design is essentially done. The details of the electrical wiring are being finished next month. The design of the stand-alone controller for the diagnostic instrument manipulator (DIM) has started. The DIM detailed mechanical drawing package will be finished next month. The electrical design was started this month.

The integration effort continued through the month. Engineering support is being provided to the architectural firm to work out issues with the present and future construction packages. Issues with the design of cable trays and conduits have been resolved, which solves the past month’s issues with clearance problems and egress routes.

A draft of the software design specification for the Target Area Data Archival System has been written and is being reviewed.

Target Area Structures

Target Area Government Furnished Equipment (GFE) Components: Modifications to the mirror frame structures in the target area have proceeded based of the preliminary optical beampath calculations; small changes can be accommodated when the beampath calculations are finalized. A preliminary design schedule has been provided that will be reassessed as we continue with the design. Revised cost estimates for design completion were provided for the ECR. RFB for the target bay GFE mirror frames, beam tubes, and associated guillotines are expected to begin in June and continue through September, pending final designs.

Additional design support is being sought for work on the beam rotation redesign.

Target Area Beampath and Utilities: Parsons structural designers continue to prepare support structures for the horizontal beam tubes and beam-tube inserts that line the concrete holes between the switchyard and the target bay.

Target Chamber Service System (TCSS): The TCSS Utility Lift design and fabrication contract was released for quotation as a phase-funded contract ($700K FY00; $500K FY01) in January. The proposal includes incentives for early delivery in an attempt to avoid delivery delays experienced by SF vessels and beam tubes. A bidders' conference and site tour was held January 27. Bids are due March 1.

Target Area Handling: The design of the lifting fixtures for the target area mirrors (LM6, LM7, and LM8) was put on hold pending the outcome of the beam rotation issue at the target chamber. Mirror package sizes and locations will be established as part of the beam rotation response. Work is expected to resume in February.

Design efforts on Target Area handling are continuing between LLNL and Parsons. This work includes defining the criteria for the 29'-6" access door and the Rotunda Hoist.

Numerous Target Area handling deliverables were transmitted to Parsons, including: (1) procurement package drawings and specification for the utility lift system; (2) utility requirements and facility piping requirements for the TCSS; (3) LLNL 3D model of the TCSS; (4) clarification of requirements and design details for the plenum plug and its associated removal mechanism; and (5) the list of GFE for the calorimeter spool assembly installation (1/27/00).

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Final Optics Assemblies

Final optics: Good progress is being made in the design of the FOA. To reduce the risk of optics damage, the basic design has been re-evaluated. A revised configuration was developed that contains a reduced number of at-risk components and that reduces beam modulation, thereby reducing the peak fluence that the optics have to survive. The two specific changes proposed are: (1) eliminate the color separation grating (CSG) and replace it with a wedged lens and (2) move the beam smoothing optic from the 3ω section to the 1ω section and change its construction from a kinoform phase plate (KPP) to a continuous phase plate (CPP). The diffraction created by the CSG also created near-field beam modulation that significantly increased the fluence in the 3ω section of the FOA. The reconfiguration to a wedged lens eliminates this effect and also addresses the beam rotation problem in the transport of the light to the FOA. Moving the beam smoothing optic has a small (<0.2% loss) effect on frequency conversion, but it provides for additional reduction in beam modulation and consequent potential for damage.

The hardware upgrade to the Slab Lab facility was brought on-line. (This is intended to better facilitate 3ω optics damage measurements and improve the understanding of sources and possible fixes for 3ω optics damage.) This upgrade improved the test beam uniformity, added the capability to scan a six-inch optic in vacuum, and added the capability to introduce background gases in the test environment. Testing over the next months is aimed at improving the data on damage initiation and growth.

A 41-cm z-cut KDP crystal was run successfully through the full NIF crystal cleaning, thermal annealing, and coating processes using the NIF equipment. Etch pit mitigation efforts continue to focus on development of HMDS-treated sol synthesis and diluent solvent selection to simultaneously meet NIF coating thickness uniformity and repeatability specifications. A matrix of polar-nonpolar and high-low evaporation rate solvents indicates that a low vapor pressure, nonpolar alkane, such as decane, should provide the required solvent properties.

PROBLEMS / IMPACTS / CORRECTIVE ACTIONS

Beam rotation issues continue to impact schedule and design completion costs. An ECR for preliminary design was approved by the CCB4 Board in December. Another ECR will be prepared to cover cost and schedule impact of completing the final designs. The Target Area Structure and Enclosures group lost two contract designers at the end of January. This effort is now four designers below the level needed to

complete the redesign by August as planned. Efforts to increase the design staff are being worked with program Engineering Services.

The rebaselining effort continues to cause delays in the purchase of parts for the target positioner. A review of the target positioner schedule shows that delaying the procurements for the target positioner to next year will put it on the critical path. A request was made to continue with the present schedule and not delay the target positioner work until next year.

A second egress route from the diagnostic mezzanines at 7’10” has been identified. A meeting will be held to obtain concurrence of all people involved.

PROCUREMENTS

No procurements were awarded in January.

The procurement for the target positioner boom was to be delivered in December. Due to manufacturing delays, the delivery is delayed.

VARIANCES

The rebaseline process has not been completed, so there are currently no variance statements for FY00 cost or schedule. As previously reported, the FY99 milestone award: Turning Mirror Structures, TA8410105, originally planned for May 1999, with an estimate for December 1999, will be further delayed due to the beam rotation problem. Preliminary projections are for a phased award starting in June 2000.

The late delivery of the target positioner boom will not have a significant overall affect because of the amount of float in the schedule.

UPCOMING MAJOR ACTIVITIES

Continue to contribute information to the beam rotation solution.

Continue redesign of TB GFE components as required.

Award TCSS utility lift design/fabrication contract.

Review vendor’s (PaR) boom lift 100% design package.

Continue to work for completion of Title II designs for the target positioner, the first-wall panels, the DIM, and the target diagnostic data acquisition system.

Start procurement of parts for the first-article DIM.

Finish the rebaselining activities.

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WBS 1.9 OPERATIONS SPECIAL EQUIPMENT

ACTIVITIES

Optical Transport and Material Handling

Overall Assessment: The primary focus has been on design/drawing completion of the delivery systems and the testing of the first-article systems. The integrated tests of the bottom-loading universal delivery system continues including docking, cover removal, and PEPC LRU insertion. The first fabrications and hardware for the flashlamp and amplifier slab delivery systems are in procurement, and prototype tests of cover removal systems and cover seals are under way. The procurement process for the second and third transporter has begun and will be awarded next month. This award was to take place in January, but was delayed pending specification of additional safety systems and load capacity increases, compared to the as-received specification of the first-article transporter.

Bottom Loading Delivery Systems

Universal: The spatial filter insertion system (SFIS) hardware was received and is being assembled for initial fit-up testing. One major component received out of tolerance and had to be returned for rework. The assembly of the SFIS was started. The testing of the system will begin next month.

The precision alignment of the kinematic features for the LRU inside the canister has been completed by the precision engineering group in the Manufacturing and Material Engineering Division. The features have been aligned to the plane established by the “docking balls” located at the top of the canister. These features include the kinematic joint planes on the permanent carriage, the rectangular spacer, the triangular spacer, and the PEPC spacer. Having these features aligned will greatly enhance the likelihood of a successful LRU insertion/removal. The PEPC LRU insertions/removals will resume next month with the realigned canister.

The beamline cover seal has been successfully pressure tested in a docking plate. This verifies the “P-seal” design of the gasket. A beamline cover was successfully installed and removed with its gasket from the docking plate.

Flashlamp: Delivery of the flashlamp canister weldment will be in early March. This delay of about one month will not impact the integrated testing schedule. Machining will be complete the end of February and then the weldment will be caustic etched prior to installing

threaded inserts. In-process inspections of the welding indicate a high-quality part. The fabrication by THK of the horizontal mechanisms that position the flashlamp LRUs for insertion is on schedule with a delivery of early March. The carriage system design is complete, and the drawing package is out for RFQ with a delivery of mid-March. The top plate/cover remover drawing package has been checked, and back checks are nearly complete. Fabrication should begin in February with a delivery in early April. Designs are complete for the LRU enclosures, and electrical boxes and drawings should be completed next month.

The prototype beamline cover seals were received from the vendor. Pressure testing the seals on the beamline covers has started with good initial results. The design and fabrication of a manual tool used for cover installation/removals is complete. This tool has the ability to install and remove a beamline cover from the FAU without using the full canister/transporter delivery system.

Amplifier Slab: Procurement on the compliance cylinder assemblies and miscellaneous parts for the cover remover assembly was started. We received the FAU simulator plate and completed assembly of the pneumatics system. Procurement of the LRU carriage assembly will start next month. Detailed design of the upper canister assembly will also be completed next month. The design of the LRU insertion mechanism is progressing.

Universal Beamline Covers: A leak test of the universal cover in a use configuration was completed and demonstrated a leak rate well within requirements. A test report will be issued next month. The fabrication of the universal beamline covers and docking receivers is progressing. We are waiting for a cleaning plan from the vendor before making a visit to validate the cleaning process and the first-article inspections. An RFQ for the cover seals was sent out and a bid received. Negotiations are continuing regarding price and other procurement details. A vendor to perform the vacuum bakeout is still an open issue. If no vendor is found, we can perform this bakeout at LLNL.

Flashlamp Beamline Covers: First-article side and center covers have been fabricated, and a first-article side seal is in fabrication. The machining of first-bundle production covers was awarded to Progressive Concepts Machining. The remaining 23 bundles of covers will be procured as complete assemblies, and the orders are in work. The RFQ for the seals for all 24 bundles is out. An RFQ for the cleaning and assembly of the first bundle is in work and due out in February.

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Amplifier Slab Beamline Covers: We received the first-article slab cover machined parts and placed the order for machining of the first bundle of amplifier covers. We placed the order for production of amplifier docking receivers.

Controls: Work accomplished this month includes the completion of the assembly and wiring of all control panels for the bottom loader amplifier slab (AMP) canister. Integrated testing of the AMP canister controls system is scheduled for early next month. In addition, three of the four control panels for the bottom loader flashlamp canister have been fabricated and assembled. Wiring of these panels has begun, with plans to begin integrated testing of the flashlamp control system later next month. Mobile test stands for both the AMP and flashlamp controls have also been fabricated to facilitate these integrated tests.

Top Loading (TL) Delivery Systems

Assembly drawings are being completed and submitted under CM. The first nine vacuum covers were delivered. The delivery of the remaining vacuum covers is on schedule. Refurbishment of the TL canister started by ordering new gaskets to replace the existing Poron material. Canister docking pins were ordered for use in the OAB and Laser Bay.

Side Loading (SL) Delivery Systems

Assembly drawings are being completed and submitted under CM. We completed the detailed drawings for the SL tug and specified dimensions for the PAM shipping container for docking with the SL skid. Steady progress is being made on the development of simple, robust software applicable to all canisters. A first successful test of the new software was made on the SL canister. A new operating system was installed on the Side Loader also to demonstrate a simpler method of operating the canister GUI using a hand-held portable computer. If the performance using this method is acceptable, man-months of detached GUI building might be avoided.

Switchyard and Target Area Delivery Systems

The SY1 and SY2, CSP-19, monorail system infrastructure drawings are completed and are being checked. These drawings will be released by March 31, 2000. The monorail hoist system design is being reviewed to identify possible design changes to reduce costs. The remainder of the SY/TB activity is on hold.

Laser Bay Transporter

Received final mechanical drawing package from AGV Products based on the as built first-article transporter. This was the final deliverable from the Phase 3 contract. This contract is now completed and closed. We received a modified bid from AGV Products, which includes the new design features. The new features will improve the

transporter battery usage, increase hardware accessibility for maintenance, and enhance the transporter safety systems. The procurement of transporters #2 and #3 should be awarded next month. The fabrication of the two transporters will be approximately 8 months. A new inverter was ordered for the first-article transporter. This inverter was required to meet the need by the transporter and canisters to operate from house power whenever possible.

Mechanical Cleaning Systems

The large parts precision mechanical cleaner was set up and installed in January. Activation and cleaning process development will begin in February.

OAB Special Equipment

Parts to complete the first-article New Optical Insertion Device (NOID) were ordered in January.

The design of the amplifier slab assembly stand was completed in January. Drawings are in the process of being completed and submitted. Design work continued on amplifier slab assembly frames.

The Technical Lead for the LRU wavefront verification systems was identified this month and will begin work on this activity in February. This team is chartered with designing, building, and testing a system capable of verifying that assembled LRUs meet their wavefront specifications.

OAB Controls

Progress has been made toward finalizing the NOID controls design. Some design modifications were proposed in January, which will make the NOIDs more modular and an internal design review was conducted. The design for a more “fail safe” vacuum system affecting the NOID to end-effector connection is also being completed.

Problems, Impacts, and Corrective Actions

Engineering: One additional engineer joined the group in January, and another will be joining the group in February. Two additional technicians are joining the group in the beginning of February.

Transporter: The fabrication time for transporter #2 and #3 is now estimated to be eight months. This is an increase of two months from the old estimate of six months. This increase is due to AVG Products subcontractor’s revised estimate to build the transporter frame weldments. AGV is using a different subcontractor than the one they used for the first-article transporter. This will result in a delay of the T&H testing with the OAB systems by 2–3 months. We will meet with the vendor to explore options to decrease the fabrication time once the contract has been awarded.

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OAB Equipment: We continue to work under a parallel occupancy agreement in the OAB. Beneficial occupancy has been delayed due to a long list of outstanding punchlist items. Most of these items are minor but need to be resolved prior to beneficial occupancy.

The delivery schedule for the first OAB transporter has slipped from December 1999 to March 2000. This is not expected to have an adverse effect on other OAB activities provided there is no further delay.

PROCUREMENTS

None.

VARIANCES

The rebaseline process has not been completed, and therefore, there are currently no variance statements for FY00 cost or schedule.

UPCOMING MAJOR ACTIVITIES

The second and third transporters will be ordered in the next month.

New “crabbing” motors will be installed in the first-article transporter during this quarter.

The universal bottom-loading canister will be used for docking, cover removal, and PEPC installation/removal activities.

An LRU insertion/removal full sequence will be performed using the Laser Bay transporter and universal bottom-loading canister.

During the second quarter of FY00, the flashlamp and amplifier slab delivery systems will continue assembly and testing as fabrications and hardware are received.

The package for fit-up of the special equipment in the OAB (CSP-17) will be awarded in February, with work scheduled to begin in March—the scope of this package includes installation of cabling, racks, electrical wiring to the assembly stations, and the particle monitoring system.

WBS 1.10 START -UP ACTIVITIES

ACTIVITIES

Scope, schedule, and budget for this area are being reviewed, and plans will be discussed in the February monthly report.

PROBLEMS / IMPACTS / CORRECTIVE ACTIONS

PROCUREMENTS

VARIANCES

UPCOMING MAJOR ACTIVITIES

WBS 1.11 ES&H AND SUPPORTING R&D

ACTIVITIES

Assurances

On January 13, 2000, a construction worker was seriously injured when a 42-in.-diameter duct fell during installation. Work was suspended, and the safety procedures reviewed with the workers. An occurrence report was filed, an IA team was formed to review the accident causes, and a separate management review team was formed to look at construction safety management.

An audit of the Sverdrup QA Program looking at concrete cracking and repairs in the Target Area and Switchyards was prepared.

Technical Support

Schott is continuing to work off Pilot I amplifier slabs with 12 more shipped in January. This effort will be completed in February. Pilot II production of laser glass slabs began in mid-January as scheduled. After a few minor problems, the melt is going well. Laser glass slabs meeting NIF specifications are anticipated in February, although final verification of homogeneity will follow later.

Edge cladding from Schott's spring 1999 melt is still being worked off; 200 slab equivalents were shipped in January. The installation of a new flat-top laser glass damage tester (LGDT) was also completed in early January.

Hoya is still producing edge-cladding glass with more than 250 slab equivalents shipped to the warehouse in January. Preparations continue at Hoya for the Pilot II melting campaign. Except for the calciner (due in late March), all the necessary equipment and materials have been received.

A five-year loan agreement for the use of platinum in laser glass production was signed by DoD and LLNL.

Approximately 200 NIF optics are in process at Tinsley with 130 in the final phase of manufacturing. Work is progressing on the 120" continuous polisher, but its unavailability is limiting production of switch and vacuum windows. Currently these optics are being fabricated using a less-efficient high-speed polisher, resulting in more small tool polishing than desired. The NIF cleaning station is now operative. Draft QA plans and metrology procedures have been delivered to LLNL as required and are currently in review.

Kodak has now demonstrated on an AMPLAB slab that they can correct the wavefront error to within the NIF specifications in one iteration when the starting wavefront error is less than one wave. Specifically, Kodak was able to improve the peak-to-valley wavefront a factor of 7.6 (from 0.713 to 0.110 waves) and the rms gradient by a factor of 3.9 (from 0.0367 to 0.00957 waves /cm) in one pass. The corresponding NIF specifications are 0.3333 waves P-V and 0.01111 waves/cm. The new chiller has now been installed on the pad polisher. With the increased cooling capacity as well as the improved temperature control, Kodak is now able to easily finish parts to a flatness of within 5 waves. The articulated arm that will be used to load and unload optics from the pad polisher is currently being installed and tested.

Zygo demonstrated that the material inhomogeneity in some polarizers and in the Pilot I amplifier slabs is uncorrectable by lap finishing. The first set of polarizers and amps will be deterministically finished by small-tool and ion figuring in March, pending completion of additional fixturing. A total of 50 mirrors, 2 polarizers, and 20 amplab laser glass slabs have been shipped from Zygo. A total of 140 optics are in process.

The Laboratory for Laser Energetics (LLE) has eliminated the 3-lobe nonuniformity by modifying the gearing ratio of their planetary. The remaining nonuniformity is radially symmetrical, which will be corrected by mask modifications. The LLE conditioning stations were completed in January.

Spectra-Physics installed a new control system on their coating tank as one of their final production readiness activities and are actively debugging the system. Training for the 18-inch interferometer at Spectra-Physics was completed. The acceptance testing of this device is scheduled for February.

LLNL and Moore Tool agreed to a list of items needing repair or adjustment on the KDP final finishing machine. LLNL will delay acceptance testing to evaluate whether the machine will meet NIF requirements for roughness after the improvements are completed. Acceptance testing is expected to resume in March. The KDP boule facing machine is now in use as a working flycutter to process LLNL KDP boules and large KDP pieces. Final alignment of the in-situ laser isogyre system should be completed in February.

Sol-gel coating of NIF-scale test optics has begun using the Chemat system. Some nonuniformity in coating thickness has been traced to very low frequency oscillation associated with the air leveling system;

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however, the statistical variation in coating thickness across the optic is comparable to that obtained from the old coating system in the B392 lab.

A new analysis of the performance characteristics of the baseline two-layer blastshield antireflection coating revealed a minimal benefit from the silicate polymer under the sol. Consequently, the baseline blastshield coating design has been changed to a single layer, ammonia-hardened sol. A manufacturing QA plan for the blastshield assembly was developed. A key feature of the plan makes use of the existing 20-lamp tester to provide accelerated lifetime data for the antireflection coatings and finished blastshield assembly.

The blast shield meniscus coating system was installed and has produced uniform coatings on 4-in. samples of B270 glass. The average transmission (450 – 900 nm) of the coated sample was 97.8%—nearly equal to the theoretical value of 98.2%.

PROBLEMS / IMPACTS / CORRECTIVE ACTIONS

Kodak installed the new chiller, and the Speedfam pad polisher is now meeting performance expectations.

Tinsley continues to be unable to ship lenses due to lack of optical test. The design of the Lens Optical Test System has been completed, and the fabrication contract is expected to award in February. Work continues at Tinsley to bring the performance of the 120” continuous polisher up to requirements.

The new gears installed in December on LLE’s planetary eliminated the three-lobe nonuniformity as projected.

Diode failure rate on Wyko interferometers remains a concern. It is projected that another diode will fail somewhere in the vendor complex prior to implementation of longer life diodes. The first new diode is expected to be available in early March.

PROCUREMENTS

No major procurements in January.

VARIANCES

The rebaseline process has not been completed, and therefore, there are currently no variance statements for FY00 cost or schedule.

UPCOMING MAJOR ACTIVITIES

Hoya Corporation expects an April start-up of laser glass Pilot II at the conclusion of their edge-cladding run.

Contract to deterministically finish 20 polarizers using ion figuring at Kodak is expected to be awarded in February.

The first finished amplifier slab should ship from Zygo in February and be ready for PSDII and micro-roughness validation at LLNL.

The acceptance testing of the 18” interferometer at Spectra-Physics is scheduled for February.

An RFP for commercial fabrication of the second KDP semi-finishing machine is expected to be issued in the second quarter of FY00.

Acceptance testing of the KDP Final Finishing Machine is expected to resume in March after adjustments and corrections are made by Moore Tool Co.

The preparation for the DOE electrical safety audit will continue.

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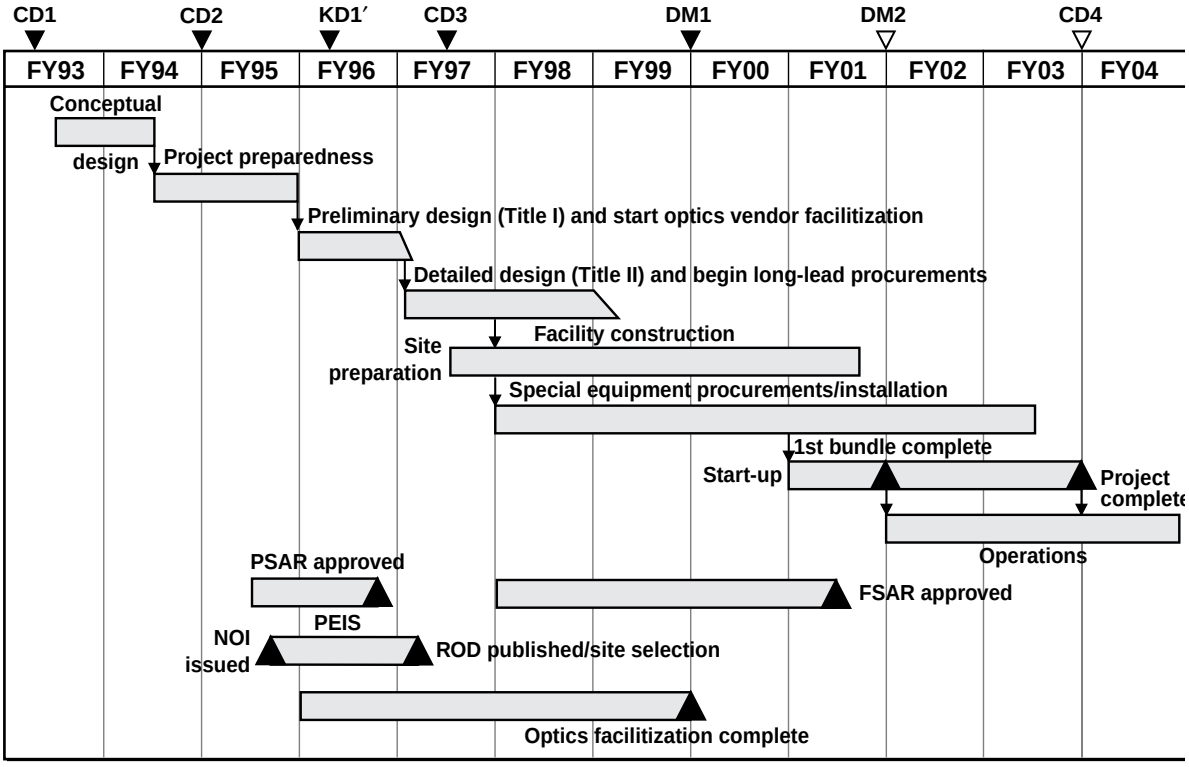
ATTACHMENT 1: SCHEDULE STATUS

The schedule status section will provide (1) a summary schedule, (2) a status of the NIF Project Execution Plan milestones, and (3) a status of the DOE performance measurement milestones.

At this point, Project schedules are being rebaselined to implement the completion options to be selected by the DOE. When the new schedules are prepared, they will be statused in the monthly report.

Summary Schedule



CD1 Approve mission need
CD2 Approve new start
KD1' Dellum's Process—NIF Study complete
CD3 Approve construction start
CD4 Approve Project completion
DM1 Optics Facilitization complete
DM2 End Conventional construction

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The rebaseline schedule will result in an update to the NIF Project major milestones to reflect the completion options proposed to the DOE. Until the rebaseline schedule is available, the current baseline will be statused.

Status of NIF Project Execution Plan Milestones

Milestones	DOE Acquisition Executive Level 0	DOE Office of Inertial Fusion and the NIF Project Level 1	NIF DOE Field Office Level 3	NIF Laboratory Project Office Level 3	Date Planned	Date Actual
Approval of Mission need (CD1)	X				Jan 1993	Jan 1993
CDR Complete				X	May 1994	May 1994
Approval of New Start (CD2)	X				Oct 1994	Oct 1994
Notice of Intent Issued		X			Jun 1995	Jun 1995
KD1' Dellums Process Complete	X				Dec 1995	Dec 1995
Architect/Engineer Contracted				X	Dec 1995	Dec 1995
Title I Initiated				X	Jan 1996	Jan 1996
Construction Manager Contracted				X	May 1996	May 1996
PSAR DOE Concurrence			X		Aug 1996	Aug 1996
PSAR Approved				X	Sep 1996	Sep 1996
NEPA Record of Decision	X				Sep 1996	Dec 1996
Approval to Initiate Title II Design			X		Sep 1996	Nov 1996
Approval to Initiate Long-Lead Procurement			X		Sep 1996	Nov 1996
Approval to Initiate Construction (CD3)	X				Mar 1997	Mar 1997
Issue Pollution Prevention & Waste Minimization Plan			X		Sep 1998	Sep 1998
Optics Facilitization Complete (DM1)		X			Oct 1999	Oct 1999
Start Special Equipment Installation				X	Nov 1998	Nov 1998
Target Chamber Installed				X	Oct 2000	
LTAB Superstructure Complete				X	Dec 2000	
FSAR DOE Concurrence			X		Feb 2001	
FSAR Approved				X	Mar 2001	
LTAB Construction Complete				X	Jul 2001	
End conventional Construction (DM2)		X			Sep 2001	
ORR/ORE Complete—Start Early Operations			X		Sep 2001	
End of Construction			X		Apr 2003	
Project Complete (CD4)	X				Oct 2003	

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Status of DOE Performance Measurement Milestones

The DOE-approved NIF Transition Period Implementation Plan contains a set of performance milestones from October 1, 1999, to June 1, 2000. These milestones are statused by DOE OAK on a weekly basis. The NIF Monthly Status provides the completed milestones at the end of January 2000.

ATTACHMENT 2: FINANCIAL STATUS

The financial status includes (1) FY00 plan to actual Cost and Cost plus Commitments monthly for Total Project Cost, Total Estimated Cost, Other Project Cost, and each WBS Level 2 element; (2) the FY00 Contingency Log as of January 2000; and (3) FY00 manpower plan to actual.

PROJECT PLAN TO ACTUAL COST AND COST PLUS COMMITMENTS

FY00 NIF Cost and Cost and Commitment plans are presently shown as straight-line estimates of the current year budget allocations. In conjunction with the rebaselining effort, provisional (pending rebaseline approval) FY00 CAPs are scheduled to be completed by March.

The January 2000 WBS Level 2 variances resulting from actual versus the drafted straight-line budget plans are not individually discussed. Total Project Cost, Total Estimated Costs, and Other Project Costs and Cost and Commitment variances ranging from 7% to 64% of actual below straight-lined plans indicate that overall FY00 costs and commitments are well within the current year funds availability. This conservatism is expected to prevail as long as rebaselining efforts are in progress.

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NIF rebaseline schedule

NIF
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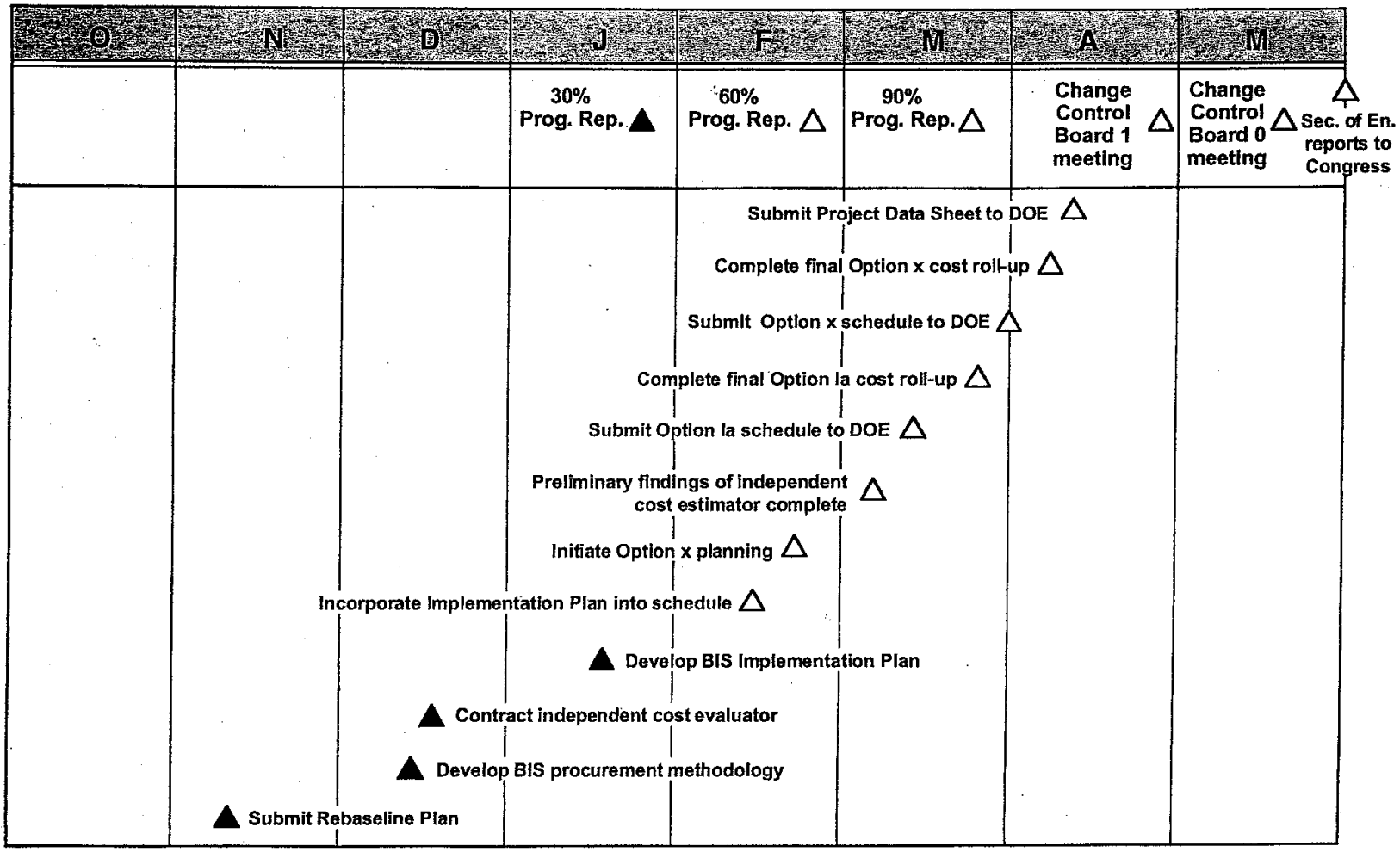

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Conventional Facilities – FY00

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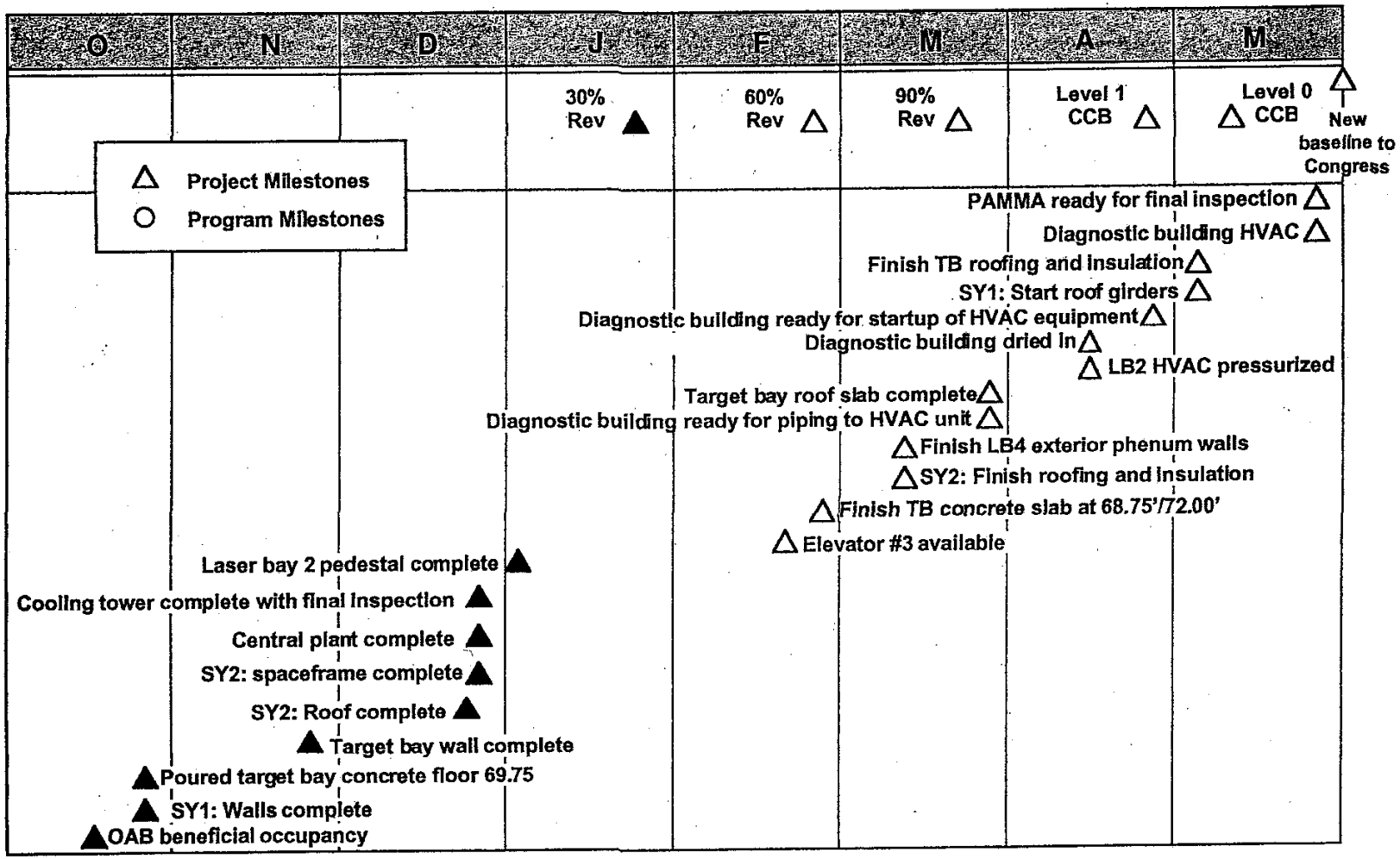
The National Ignition Facility



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Beampath Infrastructure — A/E and CM/GC – FY00

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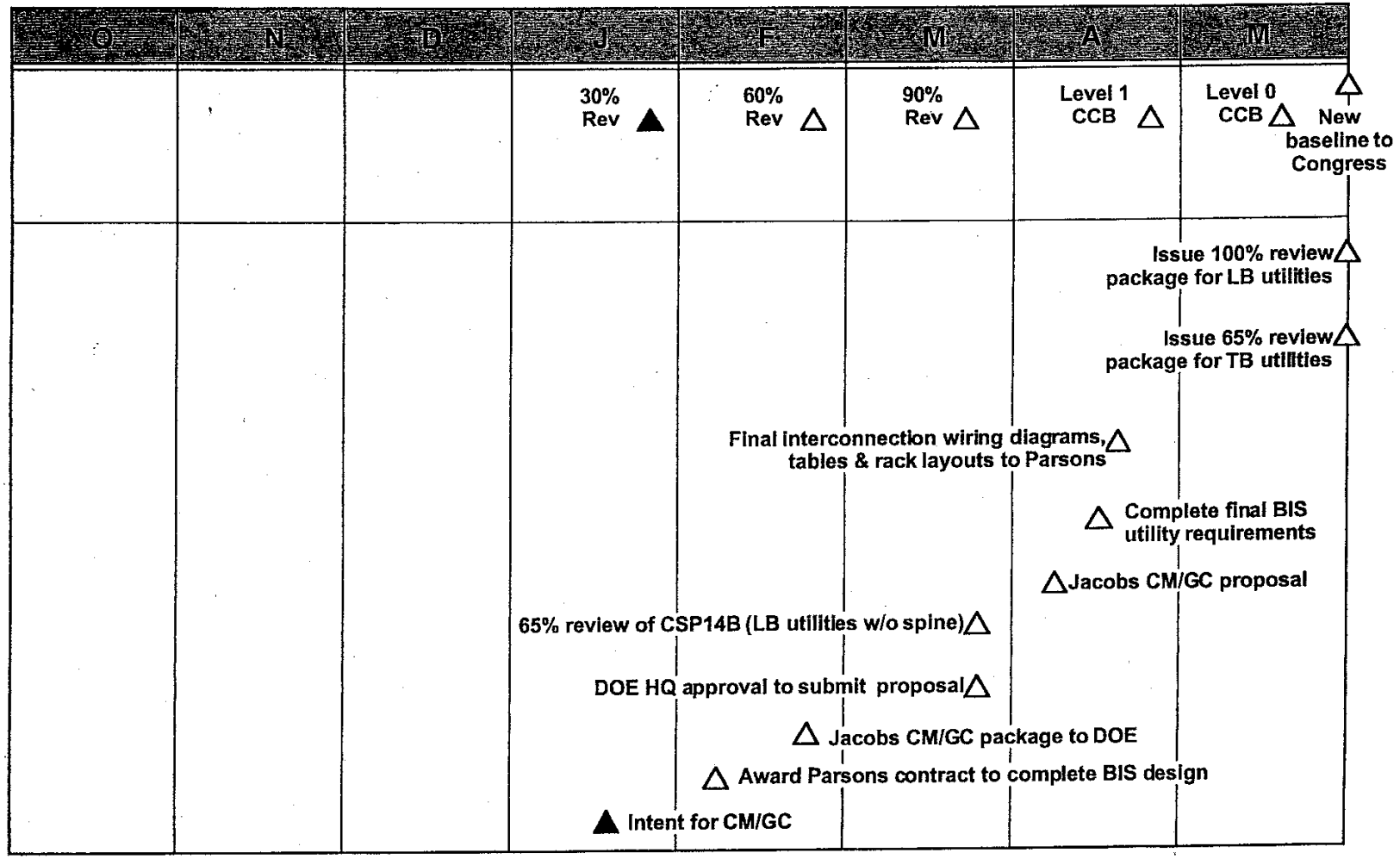
The National Ignition Facility



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Beampath Infrastructure — construction subcontract packages – FY00

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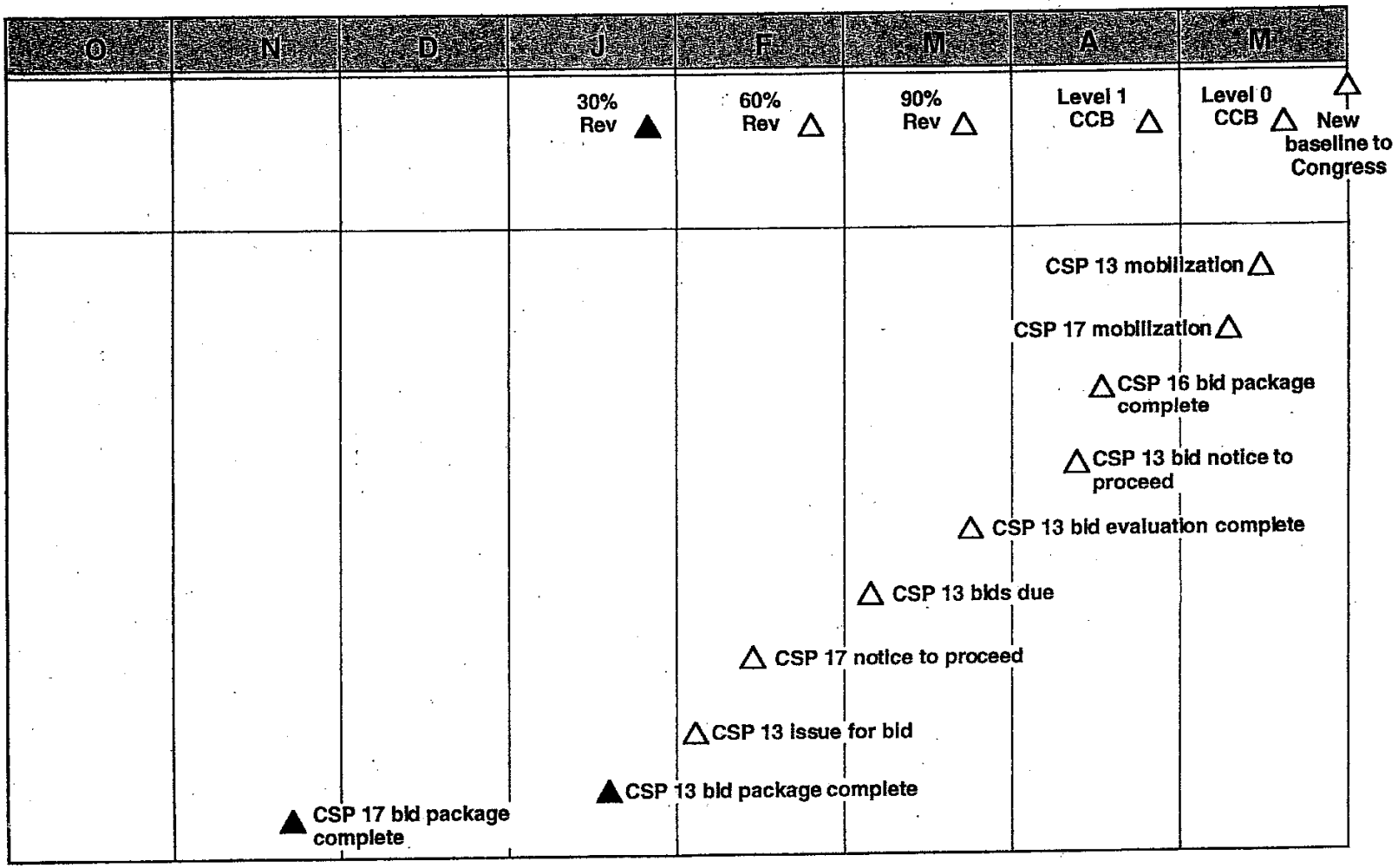
The National Ignition Facility



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Beampath Infrastructure — GFE – FY00

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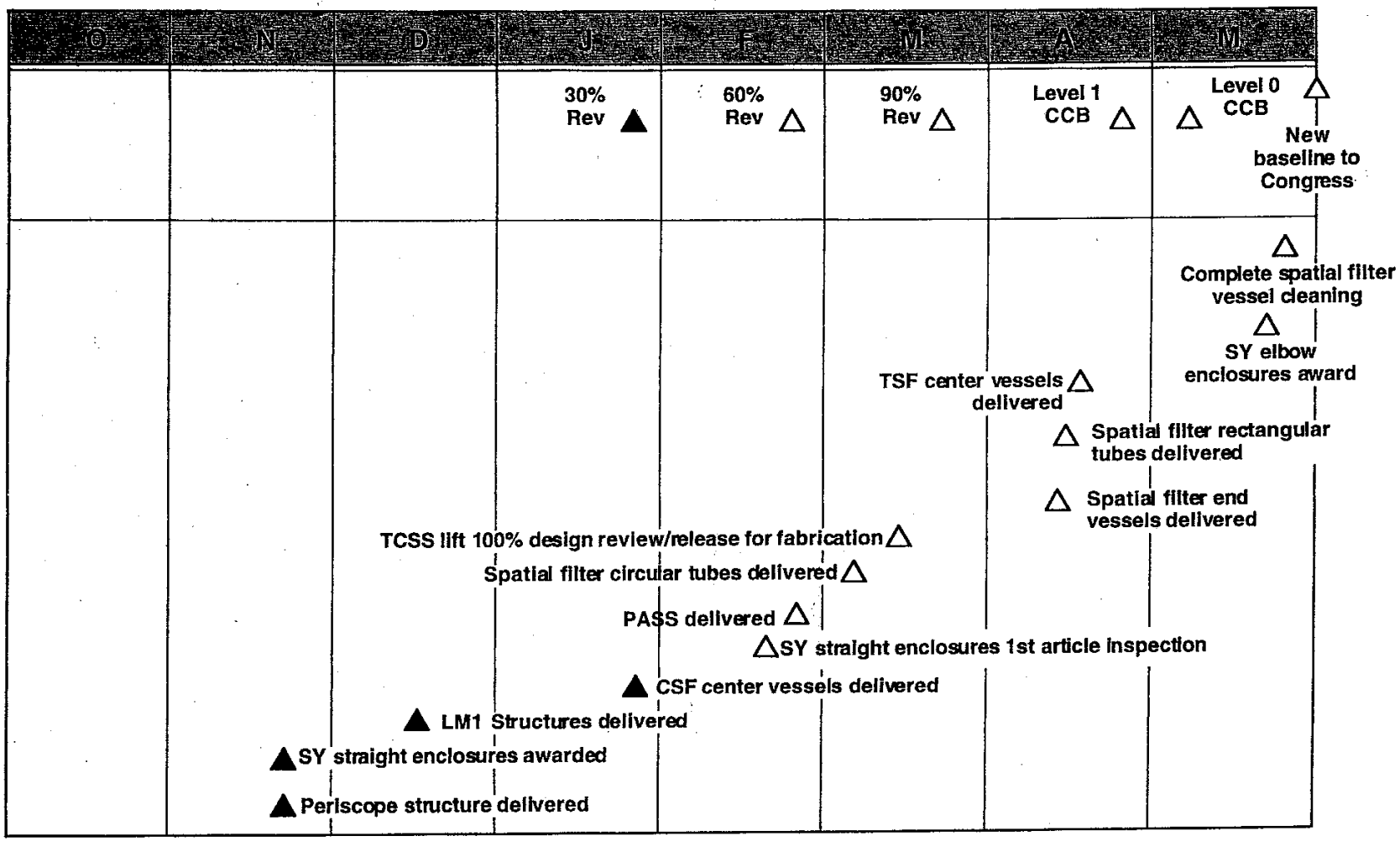
The National Ignition Facility



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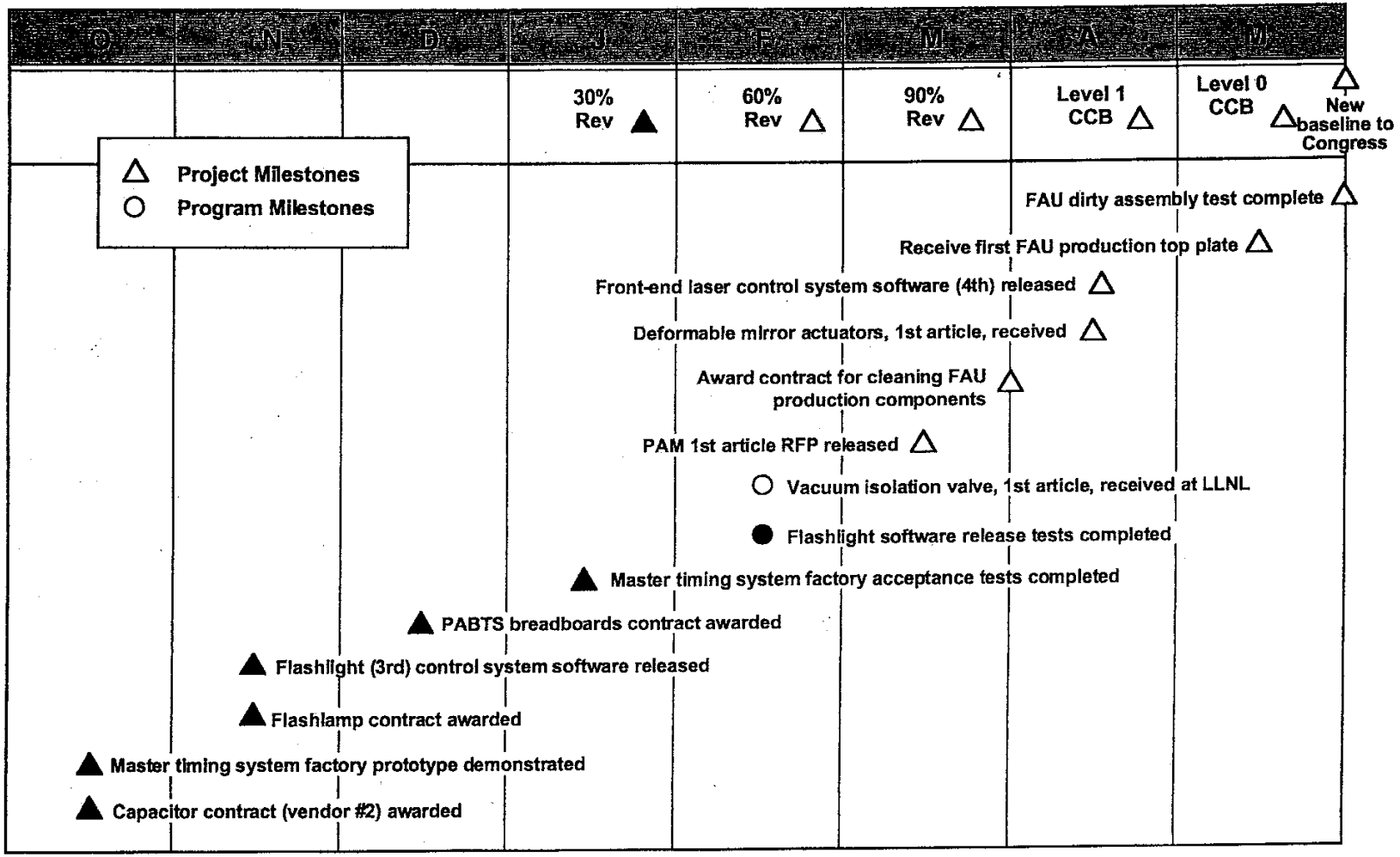
Line Replaceable Units – FY00

NIF
The National Ignition Facility



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Optics — FY00

NIF
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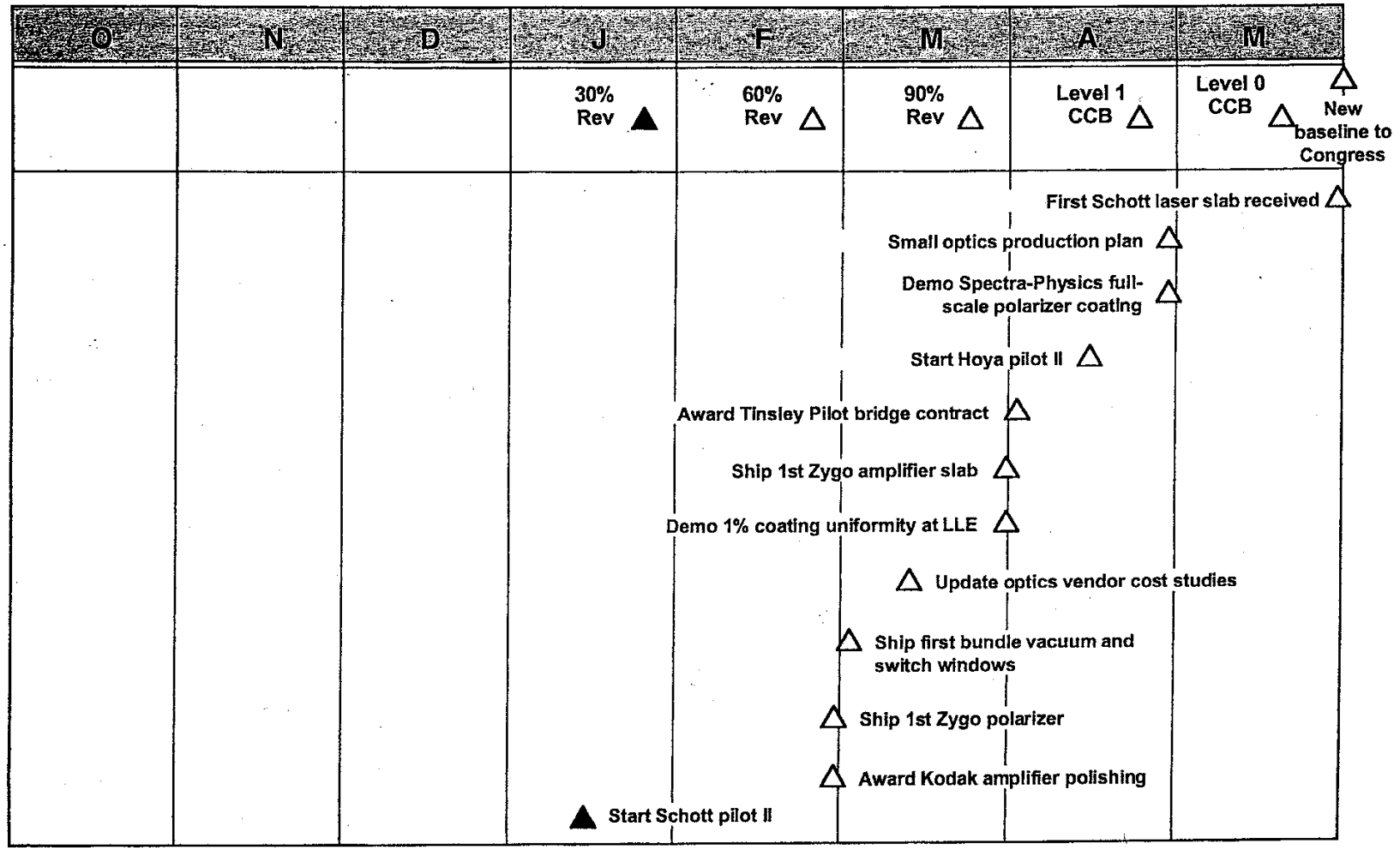

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Target Area Systems and Target Diagnostic Systems FY00

NIF
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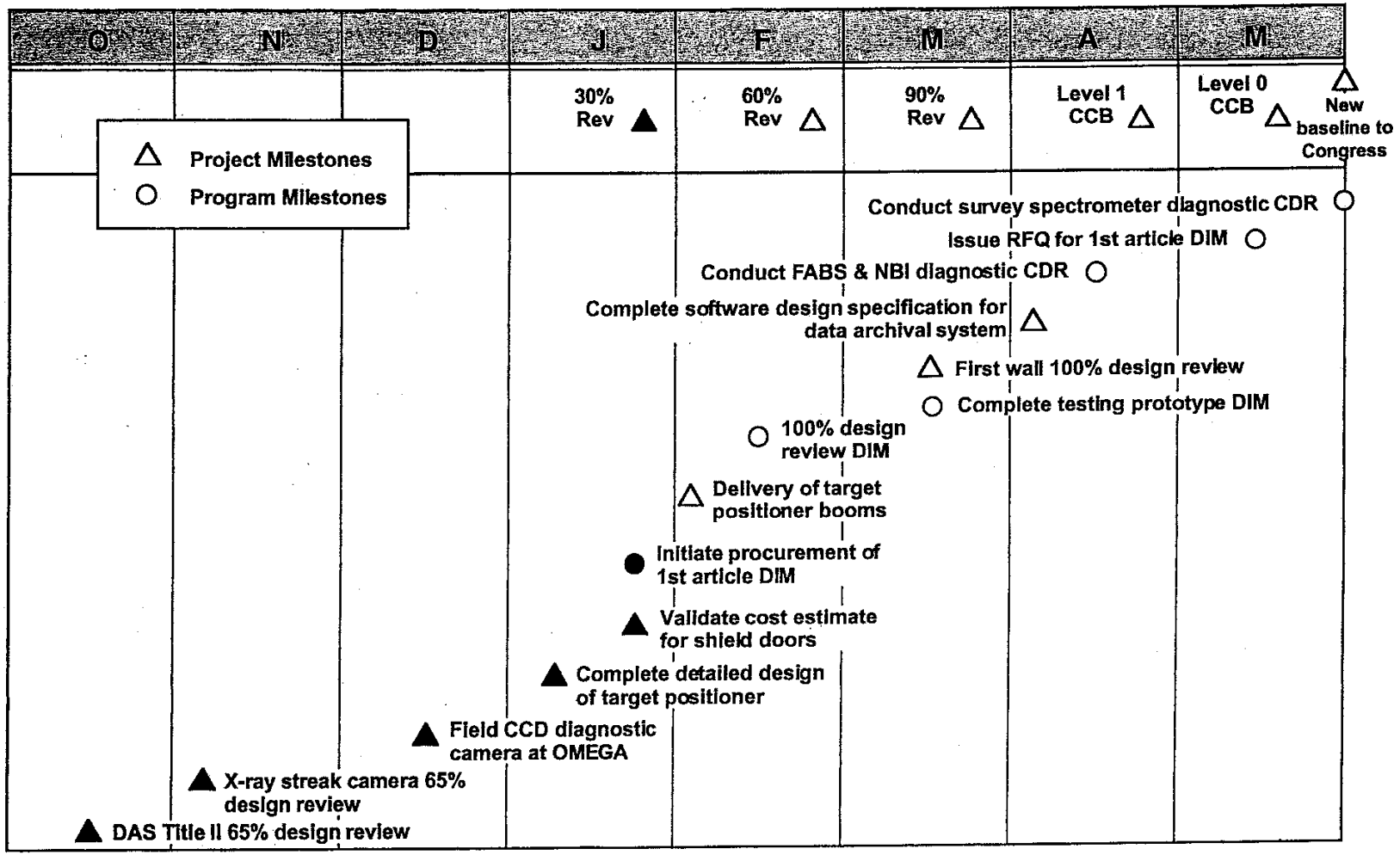

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Assembly/Refurbishment Facilities — FY00

NIF
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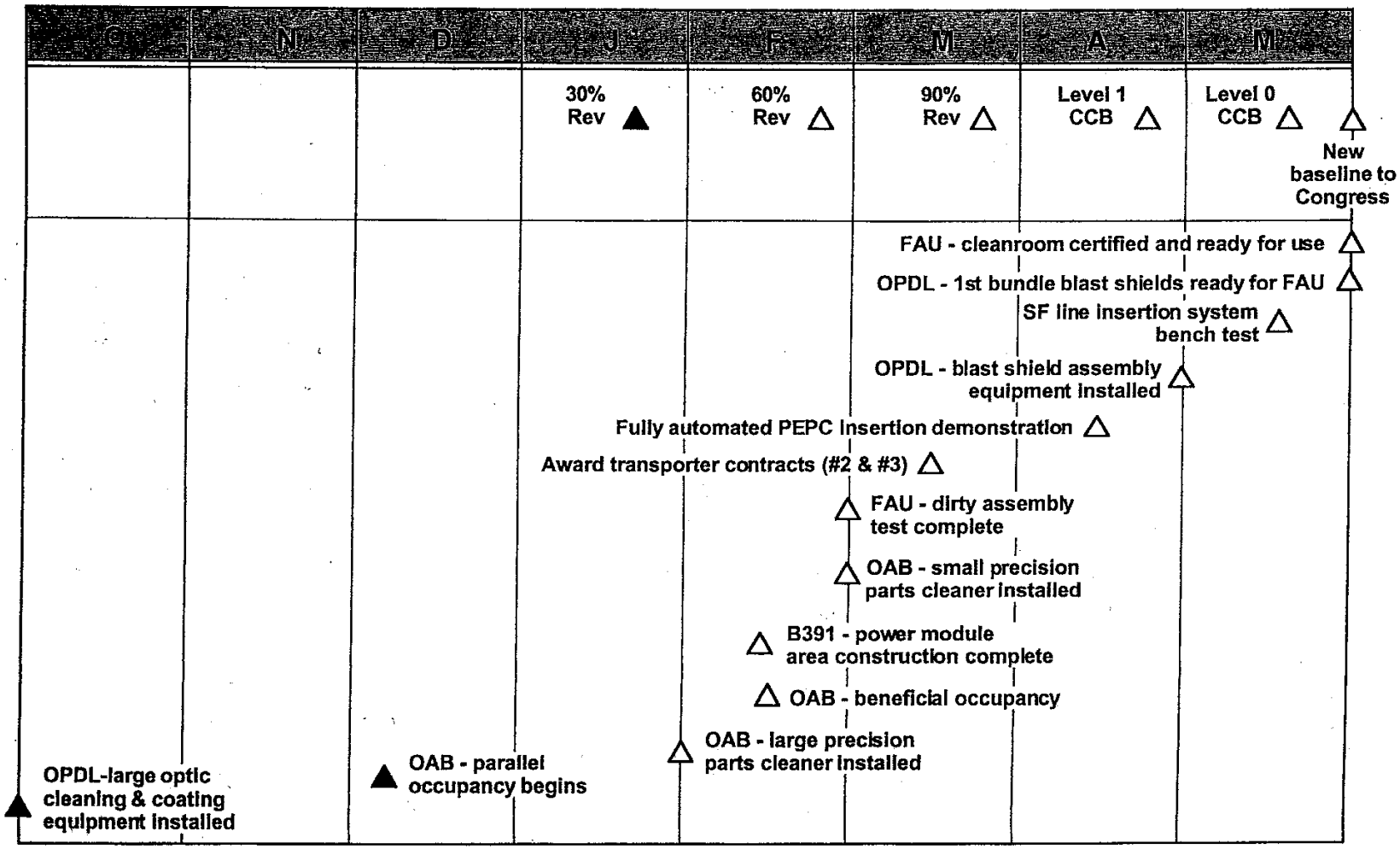

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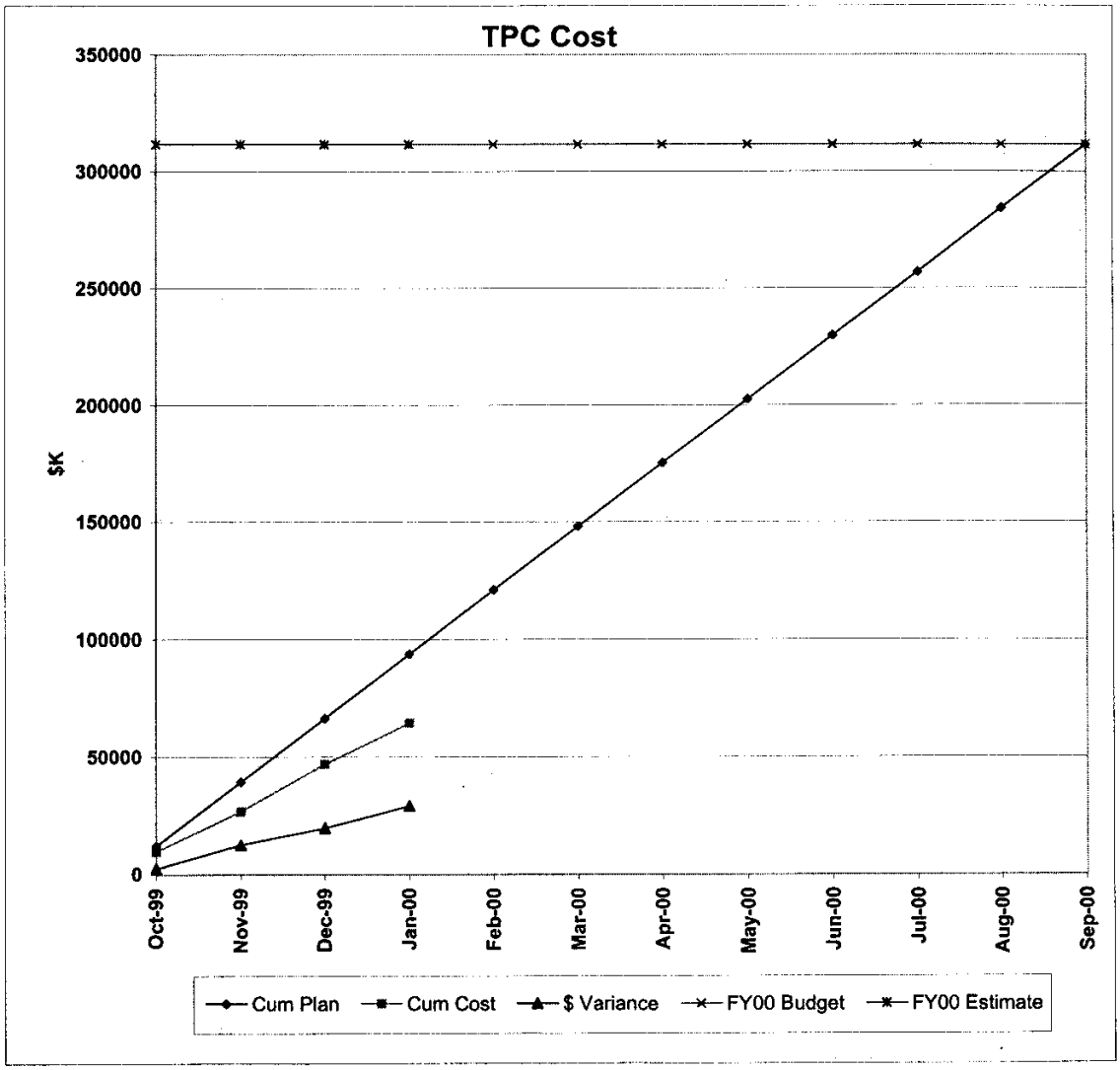
FY2000 Cost Plan to Actual
as of January 2000
Total Project Cost (TPC) ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget *	Estimate *
Oct-99	12,057	9,690	12,057	9,690	2,367	20%	311,520	311,520
Nov-99	27,224	17,043	39,281	26,733	12,548	32%	311,520	311,520
Dec-99	27,224	20,136	66,505	46,870	19,635	30%	311,520	311,520
Jan-00	27,224	17,601	93,729	64,471	29,258	31%	311,520	311,520
Feb-00	27,224		120,953				311,520	
Mar-00	27,224		148,176				311,520	
Apr-00	27,224		175,400				311,520	
May-00	27,224		202,624				311,520	
Jun-00	27,224		229,848				311,520	
Jul-00	27,224		257,072				311,520	
Aug-00	27,224		284,296				311,520	
Sep-00	27,224		311,520				311,520	



* Rebaselining in progress will establish Project TPC BAC/EAC.

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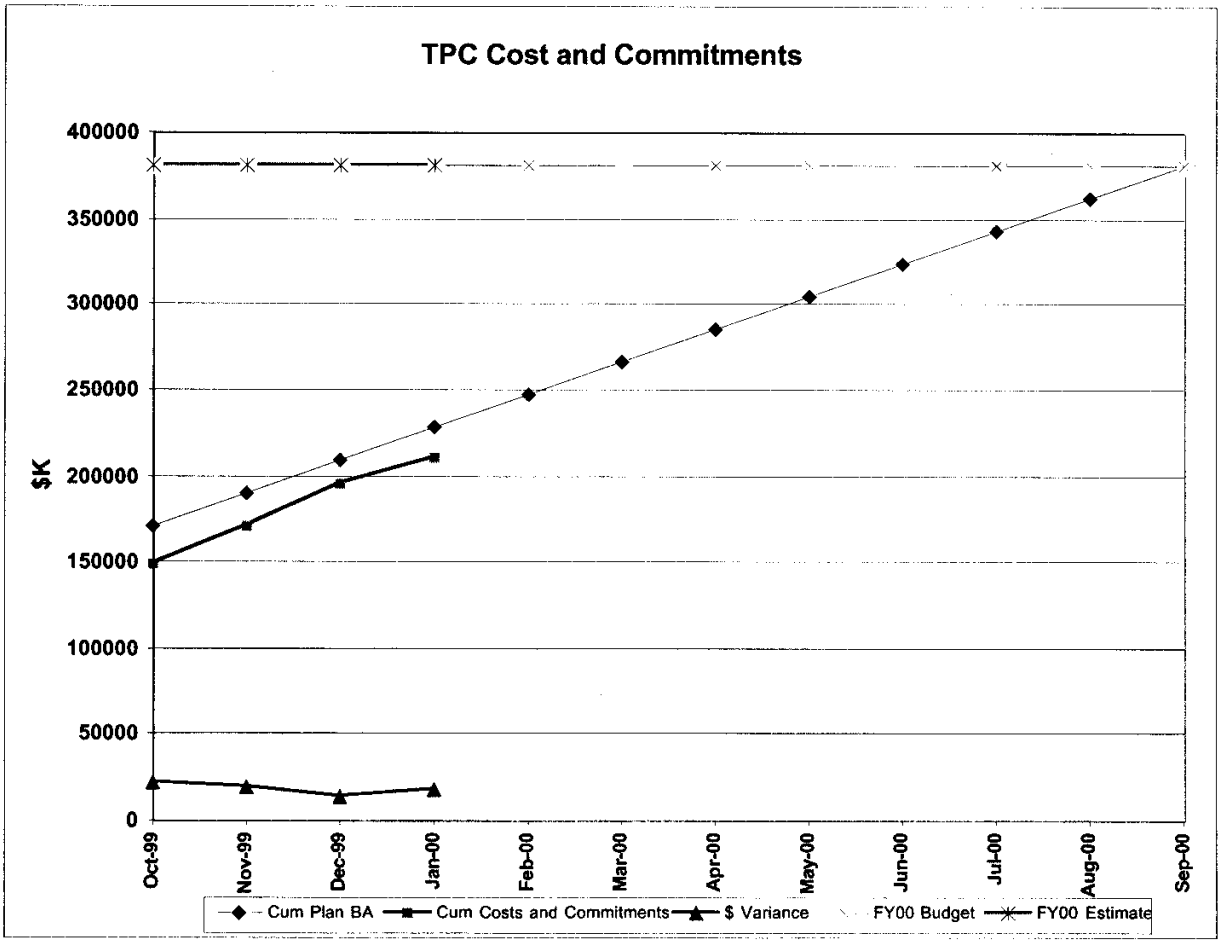
FY2000 Plan to Actual as of January 2000 Project Number 96-D-111
Total Project Cost (TPC) - Cost and Commitments ($K) January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget *	Estimate *
Oct-99	171,009 * *	149,362	171,009 * *	149,362	21,647	13%	380,409	380,409
Nov-99	19,036	21,090	190,045	170,452	19,593	10%	380,409	380,409
Dec-99	19,036	25,391	209,082	195,843	13,239	6%	380,409	380,409
Jan-00	19,036	14,699	228,118	210,542	17,577	8%	380,409	380,409
Feb-00	19,036		247,155				380,409	
Mar-00	19,036		266,191				380,409	
Apr-00	19,036		285,227				380,409	
May-00	19,036		304,264				380,409	
Jun-00	19,036		323,300				380,409	
Jul-00	19,036		342,337				380,409	
Aug-00	19,036		361,373				380,409	
Sep-00	19,036		380,409				380,409	



* Rebaselining in progress will establish Project TPC BAC/EAC.
** Includes $97,684K of uncosted obligations from FY99.

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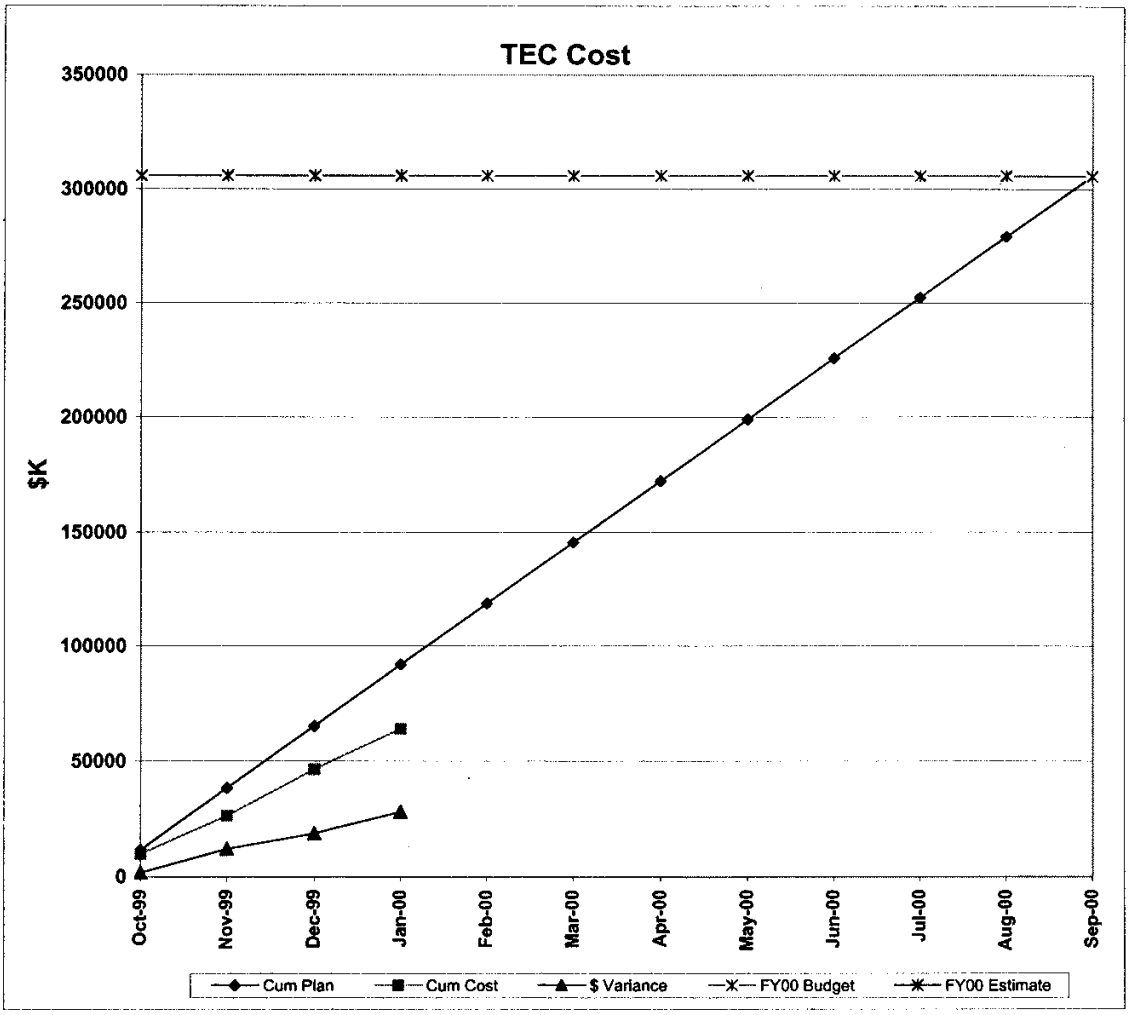
FY2000 Cost Plan to Actual
as of January 2000
Total Estimated Cost (TEC) ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget *	Estimate *
Oct-99	11,647	9,826	11,647	9,826	1,821	16%	306,054	306,054
Nov-99	26,764	16,570	38,411	26,395	12,016	31%	306,054	306,054
Dec-99	26,764	20,132	65,176	46,528	18,648	29%	306,054	306,054
Jan-00	26,764	17,295	91,940	63,823	28,117	31%	306,054	306,054
Feb-00	26,764		118,704				306,054	
Mar-00	26,764		145,468				306,054	
Apr-00	26,764		172,233				306,054	
May-00	26,764		198,997				306,054	
Jun-00	26,764		225,761				306,054	
Jul-00	26,764		252,526				306,054	
Aug-00	26,764		279,290				306,054	
Sep-00	26,764		306,054				306,054	



* Rebaselining in progress will establish Project TEC BAC/EAC.

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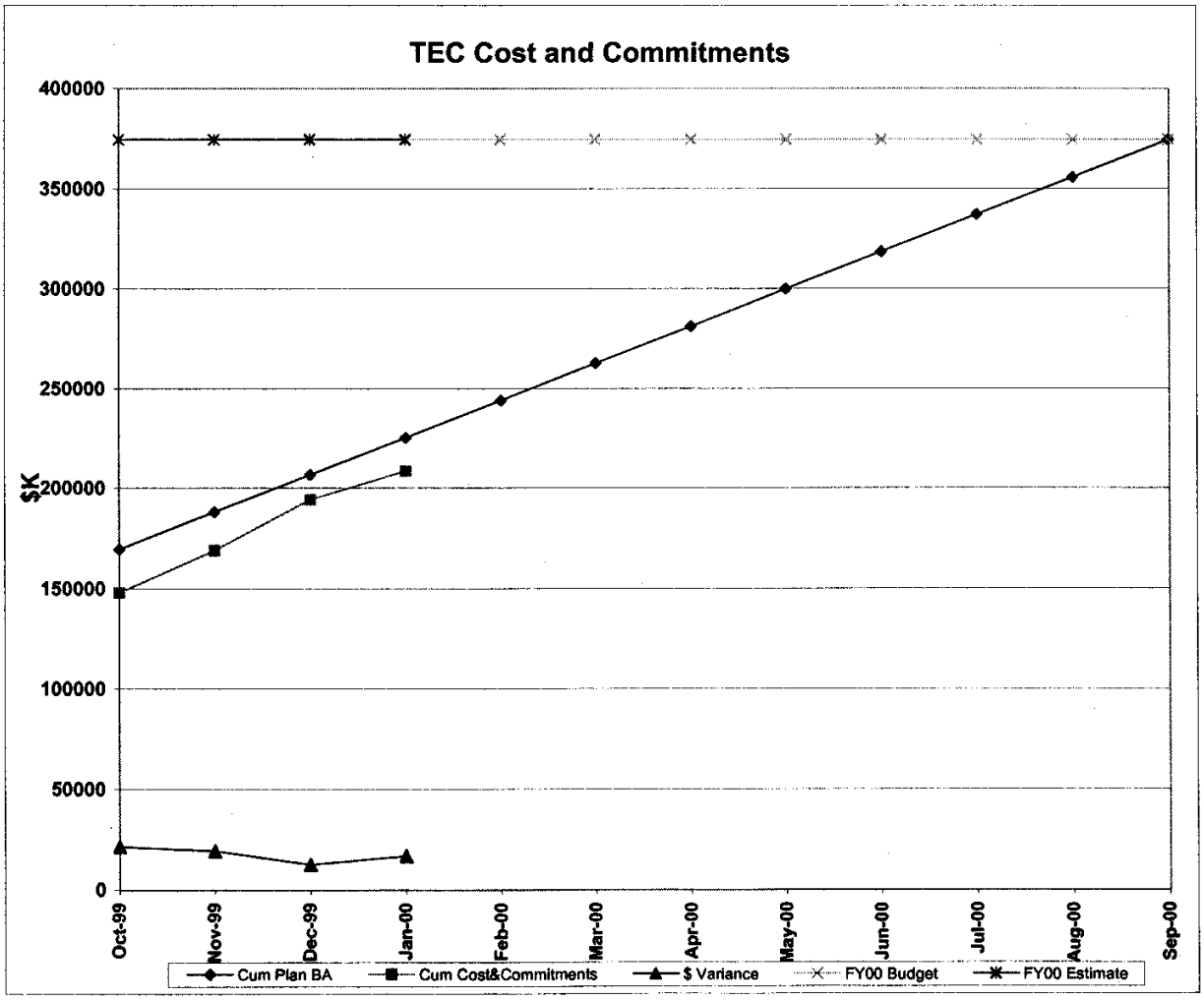
FY2000 Plan to Actual as of January 2000
Total Estimated Cost (TEC) - Cost and Commitments ($K)

Project Number 96-D-111
January 2000

Monthly			Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget *	Estimate *
Oct-98	169,417 **	148,023	169,417 **	148,023	21,394	13%	374,416	374,416
Nov-98	18,636	20,837	188,053	168,860	19,194	10%	374,416	374,416
Dec-98	18,636	25,315	206,690	194,175	12,515	6%	374,416	374,416
Jan-99	18,636	14,429	225,326	208,604	16,722	7%	374,416	374,416
Feb-99	18,636		243,962				374,416	
Mar-99	18,636		262,599				374,416	
Apr-99	18,636		281,235				374,416	
May-99	18,636		299,871				374,416	
Jun-99	18,636		318,507				374,416	
Jul-99	18,636		337,144				374,416	
Aug-99	18,636		355,780				374,416	
Sep-99	18,636		374,416				374,416	



* Rebaselining in progress will establish Project TEC BAC/EAC.
** Includes $87,940K of uncosted obligations from FY99.

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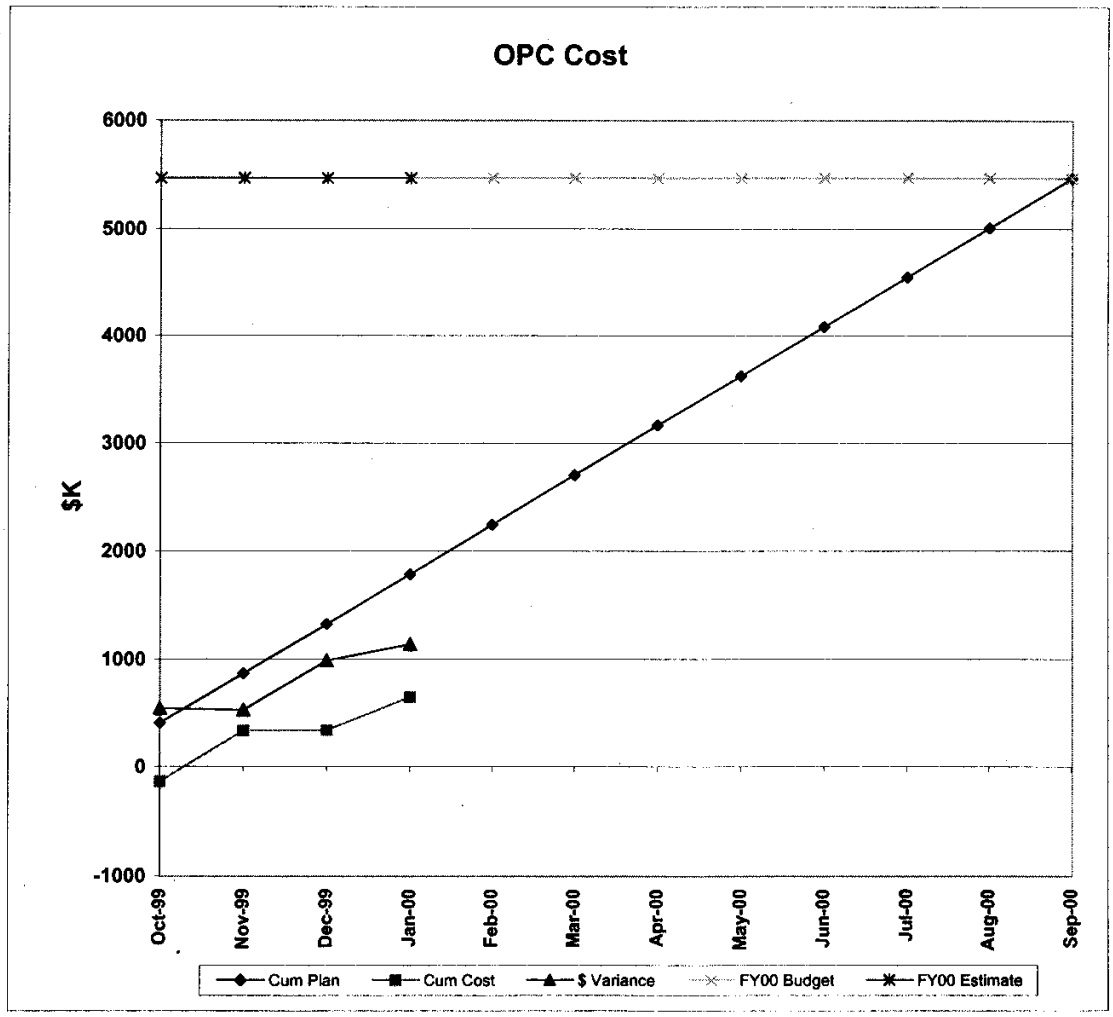
FY2000 Cost Plan to Actual
as of January 2000
Other Project Cost (OPC) ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget *	Estimate *
Oct-99	410	-135	410	-135	545	133%	5,466	5,466
Nov-99	460	474	870	338	531	61%	5,466	5,466
Dec-99	460	4	1,329	342	987	74%	5,466	5,466
Jan-00	460	306	1,789	648	1,141	64%	5,466	5,466
Feb-00	460		2,248				5,466	
Mar-00	460		2,708				5,466	
Apr-00	460		3,168				5,466	
May-00	460		3,627				5,466	
Jun-00	460		4,087				5,466	
Jul-00	460		4,546				5,466	
Aug-00	460		5,006				5,466	
Sep-00	460		5,466				5,466	



* Rebaselining in progress will establish Project OPC BAC/EAC.

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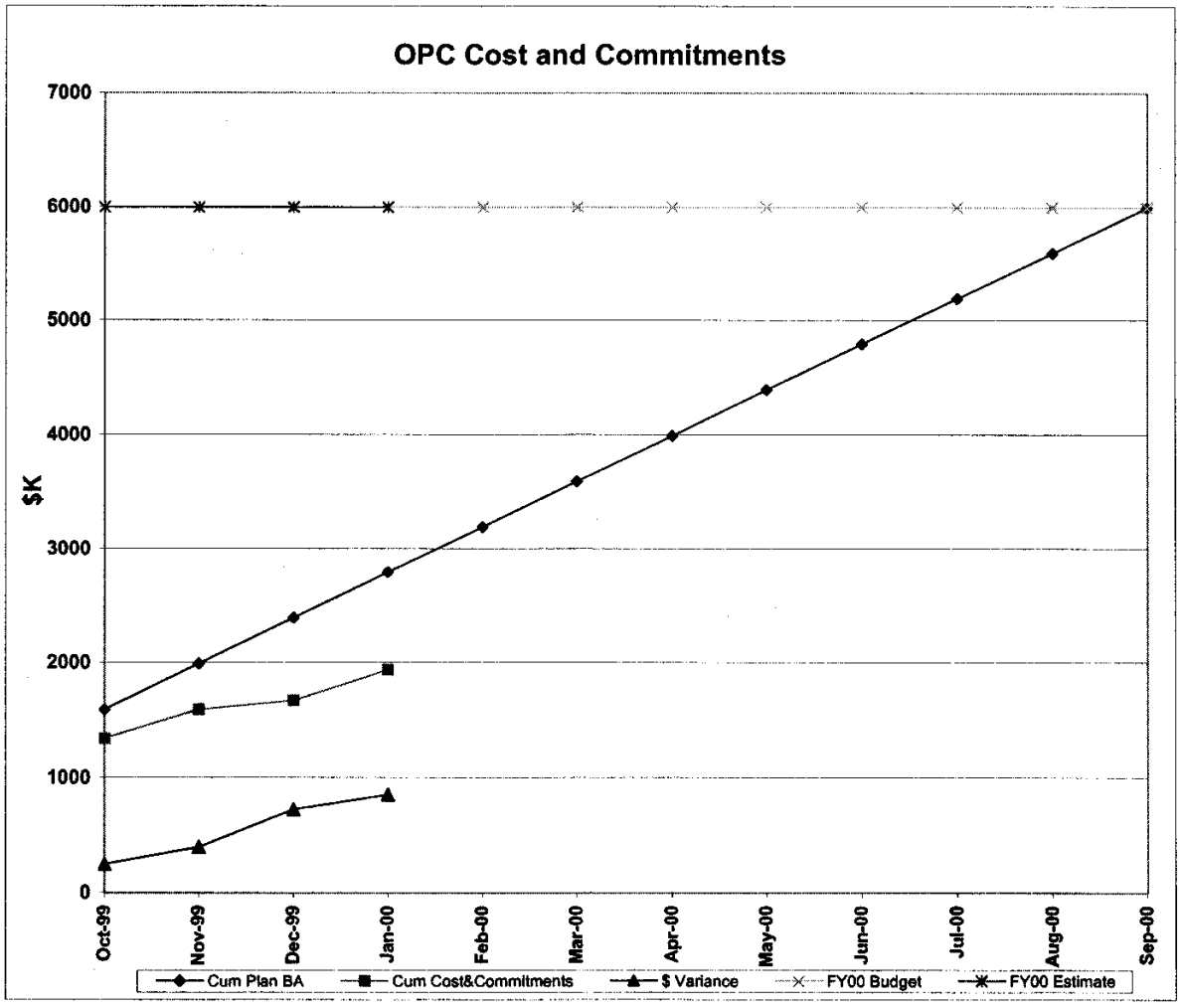
FY2000 Plan to Actual as of January 2000
Other Project Cost (OPC) - Cost and Commitments ($K)

Project Number 96-D-111
Janaury 2000

Monthly			Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget *	Estimate *
Oct-99	1,592 **	1,339	1,592 **	1,339	253	16%	5,993	5,993
Nov-99	400	253	1,992	1,592	400	20%	5,993	5,993
Dec-99	400	75	2,392	1,668	724	30%	5,993	5,993
Jan-00	400	270	2,792	1,938	854	31%	5,993	5,993
Feb-00	400		3,192				5,993	
Mar-00	400		3,593				5,993	
Apr-00	400		3,993				5,993	
May-00	400		4,393				5,993	
Jun-00	400		4,793				5,993	
Jul-00	400		5,193				5,993	
Aug-00	400		5,593				5,993	
Sep-00	400		5,993				5,993	



* Rebaselining in progress will establish Project OPC BAC/EAC.
** Includes $9,745K of uncosted obligations from FY99.

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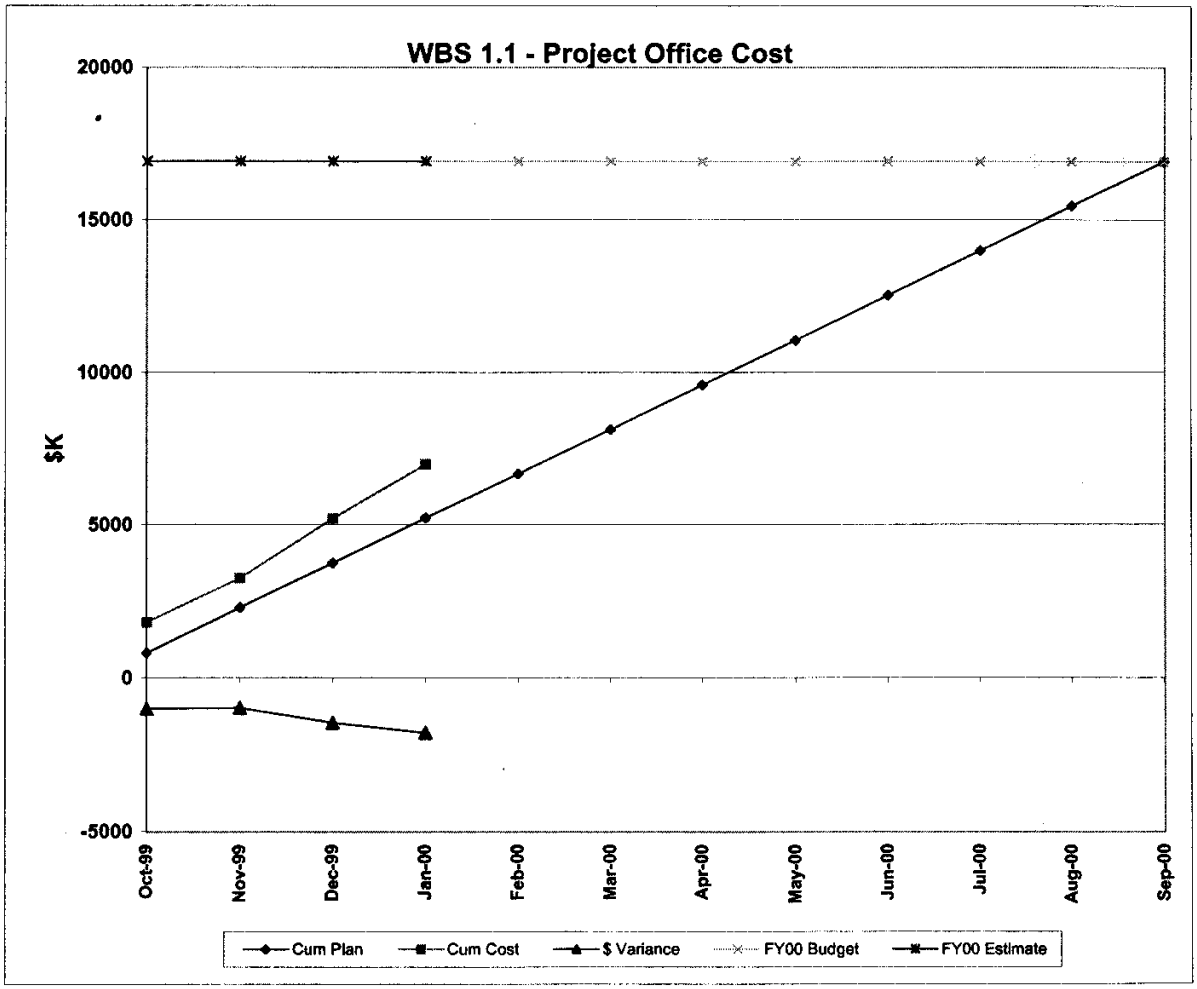
FY2000 Cost Plan to Actual as of January 2000
WBS 1.1 - Project Office ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-98	821	1,812	821	1,812	-991	-121%	16,907	16,907
Nov-98	1,462	1,442	2,283	3,254	-970	-42%	16,907	16,907
Dec-98	1,462	1,943	3,746	5,197	-1,451	-39%	16,907	16,907
Jan-99	1,462	1,780	5,208	6,978	-1,769	-34%	16,907	16,907
Feb-99	1,462		6,671				16,907	
Mar-99	1,462		8,133				16,907	
Apr-99	1,462		9,595				16,907	
May-99	1,462		11,058				16,907	
Jun-99	1,462		12,520				16,907	
Jul-99	1,462		13,983				16,907	
Aug-99	1,462		15,445				16,907	
Sep-99	1,462		16,907				16,907	



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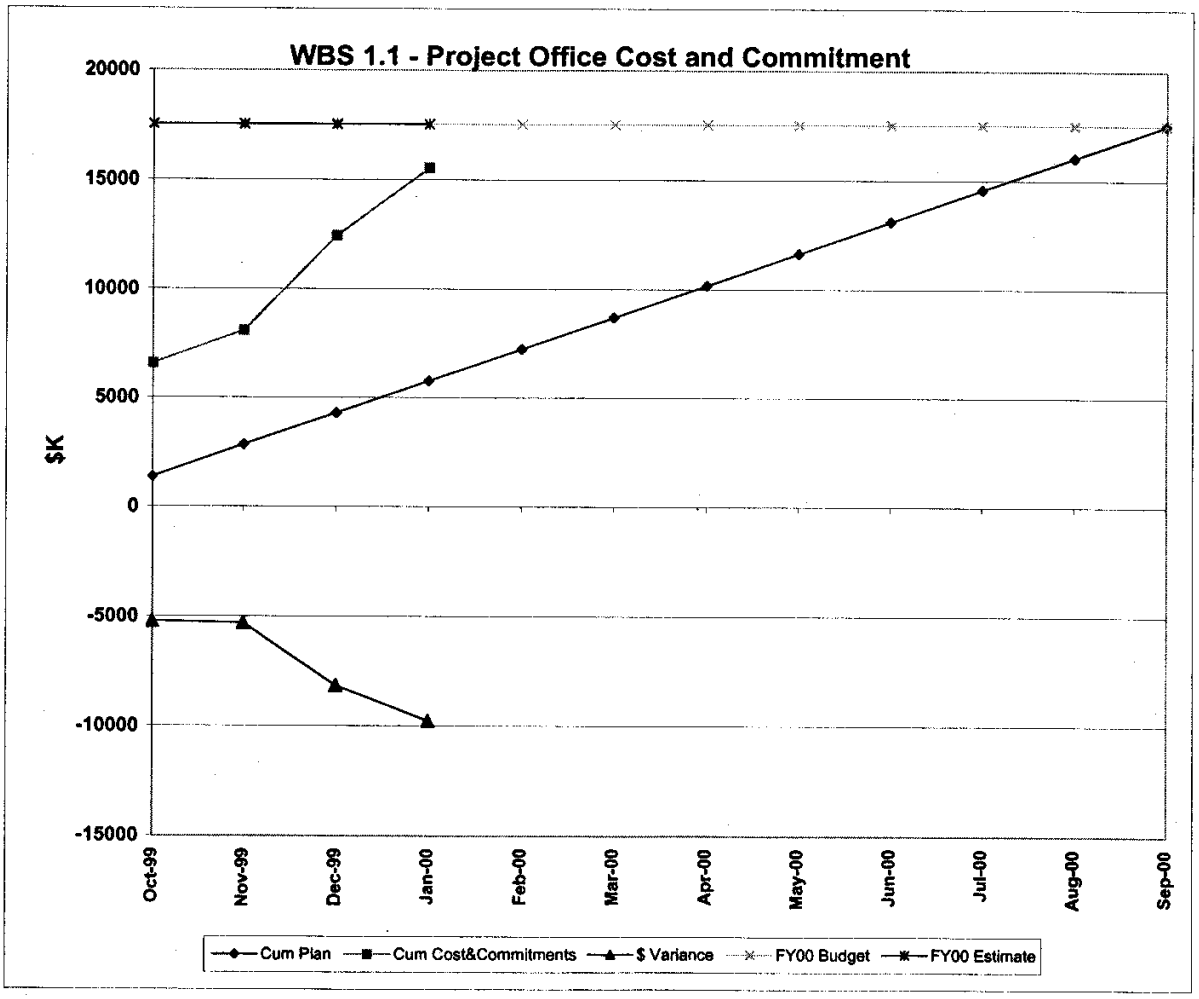
FY2000 Cost and Commitment Plan to Actual
as of January 2000
WBS 1.1 - Project Office ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-98	1,358 *	6,571	1,358 *	6,571	-5,213	-384%	17,537	17,537
Nov-98	1,471	1,531	2,829	8,103	-5,274	-186%	17,537	17,537
Dec-98	1,471	4,346	4,300	12,449	-8,149	-190%	17,537	17,537
Jan-99	1,471	3,092	5,770	15,541	-9,771	-169%	17,537	17,537
Feb-99	1,471		7,241				17,537	
Mar-99	1,471		8,712				17,537	
Apr-99	1,471		10,183				17,537	
May-99	1,471		11,654				17,537	
Jun-99	1,471		13,124				17,537	
Jul-99	1,471		14,595				17,537	
Aug-99	1,471		16,066				17,537	
Sep-99	1,471		17,537				17,537	



* Includes $4,263K of uncosted obligations from FY99.

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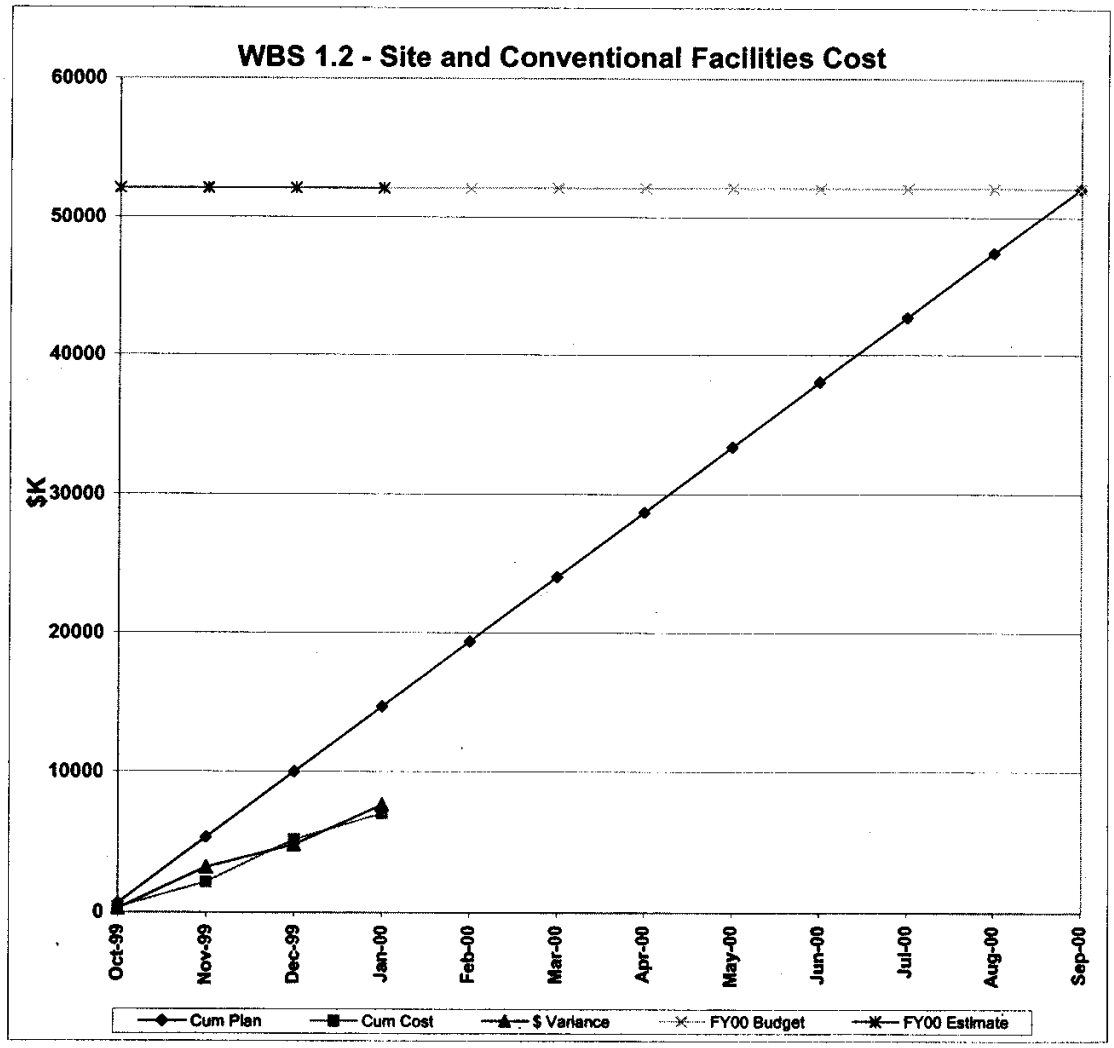
FY2000 Cost Plan to Actual as of January 2000
WBS 1.2 - Site and Conventional Facilities ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-98	664	363	664	363	301	45%	52,090	52,090
Nov-98	4,675	1,767	5,339	2,130	3,209	60%	52,090	52,090
Dec-98	4,675	3,057	10,014	5,187	4,827	48%	52,090	52,090
Jan-99	4,675	1,852	14,689	7,040	7,650	52%	52,090	52,090
Feb-99	4,675		19,364				52,090	
Mar-99	4,675		24,040				52,090	
Apr-99	4,675		28,715				52,090	
May-99	4,675		33,390				52,090	
Jun-99	4,675		38,065				52,090	
Jul-99	4,675		42,740				52,090	
Aug-99	4,675		47,415				52,090	
Sep-99	4,675		52,090				52,090	



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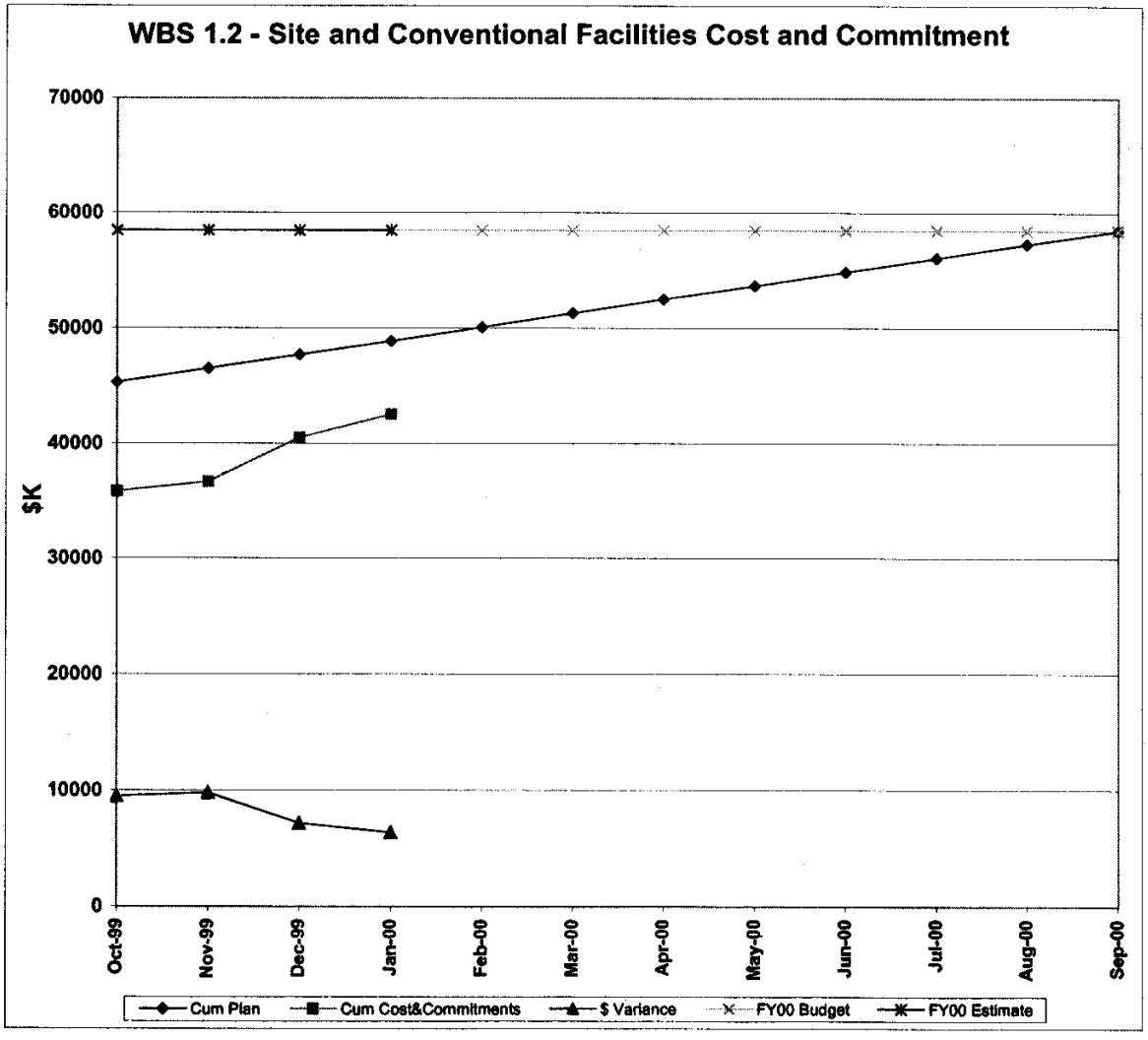
FY2000 Cost and Commitment Plan to Actual
as of January 2000
WBS 1.2 - Site and Conventional Facilities ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-98	45,320 *	35,825	45,320 *	35,825	9,495	21%	58,466	58,466
Nov-98	1,195	860	46,515	36,685	9,830	21%	58,466	58,466
Dec-98	1,195	3,842	47,710	40,527	7,184	15%	58,466	58,466
Jan-99	1,195	2,016	48,905	42,543	6,363	13%	58,466	58,466
Feb-99	1,195		50,100				58,466	
Mar-99	1,195		51,296				58,466	
Apr-99	1,195		52,491				58,466	
May-99	1,195		53,686				58,466	
Jun-99	1,195		54,881				58,466	
Jul-99	1,195		56,076				58,466	
Aug-99	1,195		57,271				58,466	
Sep-99	1,195		58,466				58,466	



* Includes $34,968K of uncosted obligations from FY99.

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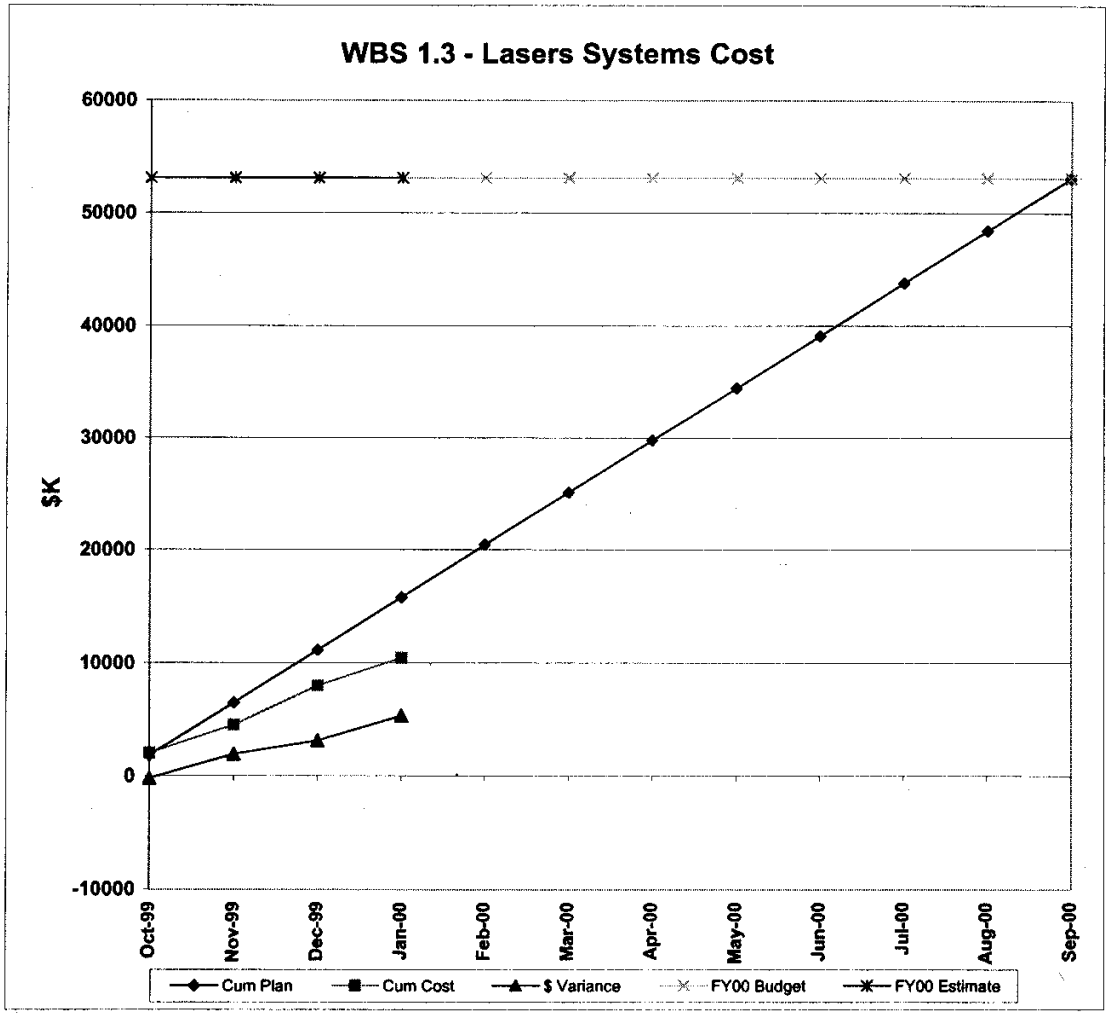
FY2000 Cost Plan to Actual
as of January 2000
WBS 1.3 - Lasers Systems ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-98	1,849	2,050	1,849	2,050	-201	-11%	53,083	53,083
Nov-98	4,658	2,517	6,507	4,567	1,939	30%	53,083	53,083
Dec-98	4,658	3,455	11,164	8,023	3,142	28%	53,083	53,083
Jan-99	4,658	2,463	15,822	10,485	5,336	34%	53,083	53,083
Feb-99	4,658		20,479				53,083	
Mar-99	4,658		25,137				53,083	
Apr-99	4,658		29,795				53,083	
May-99	4,658		34,452				53,083	
Jun-99	4,658		39,110				53,083	
Jul-99	4,658		43,767				53,083	
Aug-99	4,658		48,425				53,083	
Sep-99	4,658		53,083				53,083	



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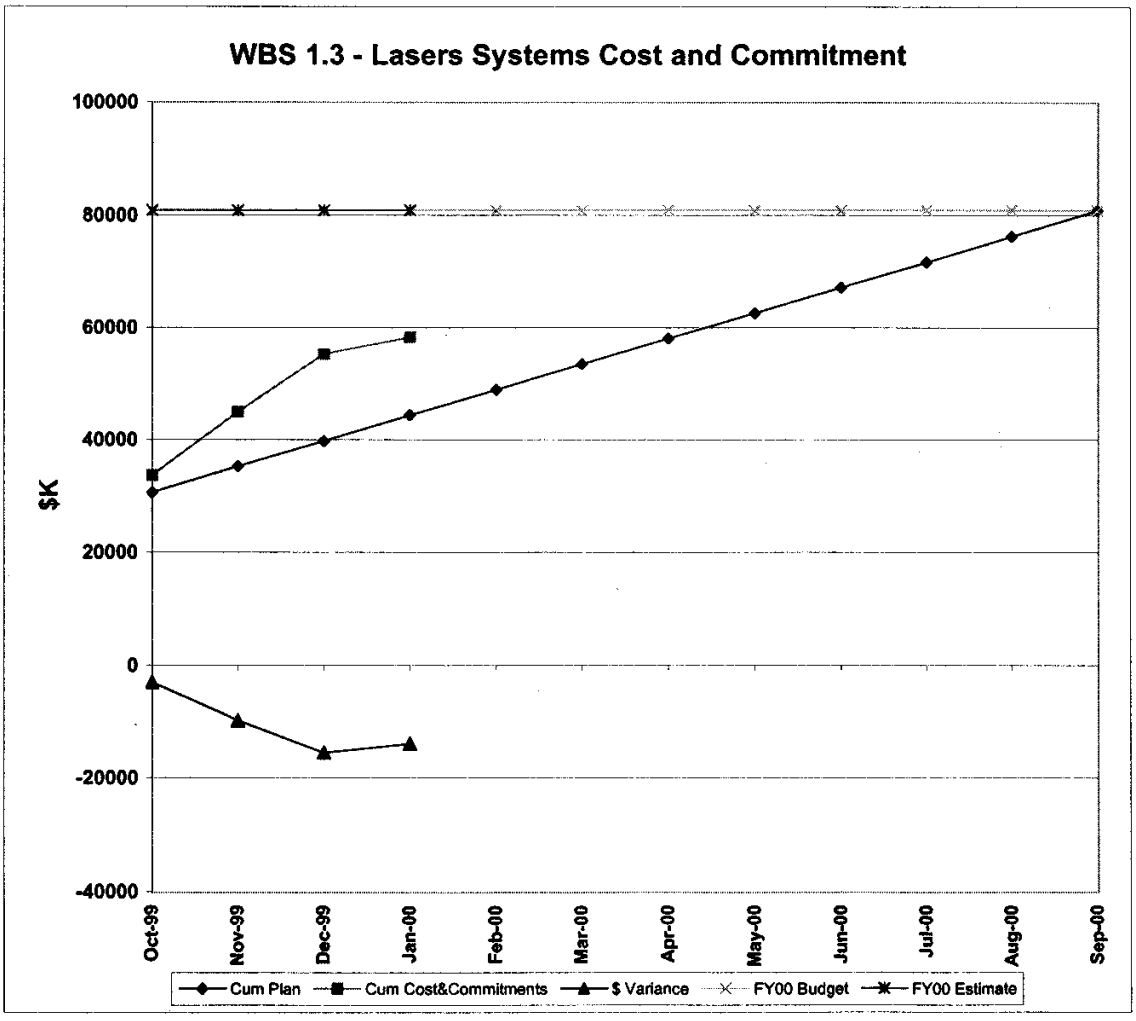
FY2000 Cost and Commitment Plan to Actual
as of January 2000
WBS 1.3 - Lasers Systems ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-98	30,661 *	33,683	30,661 *	33,683	-3,022	-10%	80,840	80,840
Nov-98	4,562	11,269	35,223	44,952	-9,729	-28%	80,840	80,840
Dec-98	4,562	10,316	39,784	55,268	-15,484	-39%	80,840	80,840
Jan-99	4,562	2,990	44,346	58,259	-13,912	-31%	80,840	80,840
Feb-99	4,562		48,908				80,840	
Mar-99	4,562		53,470				80,840	
Apr-99	4,562		58,031				80,840	
May-99	4,562		62,593				80,840	
Jun-99	4,562		67,155				80,840	
Jul-99	4,562		71,716				80,840	
Aug-99	4,562		76,278				80,840	
Sep-99	4,562		80,840				80,840	



* Includes $25,645K of uncosted obligations from FY99.

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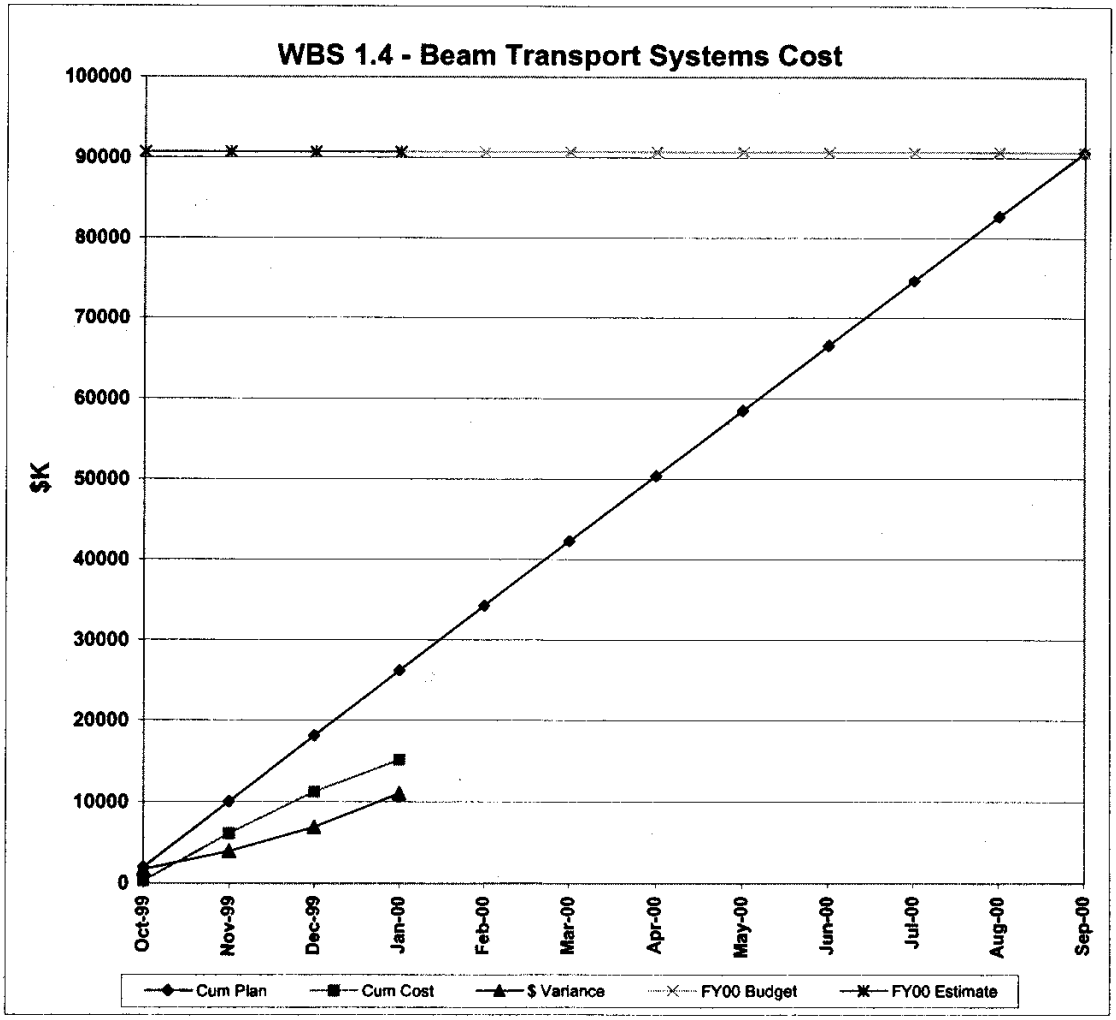
FY2000 Cost Plan to Actual
as of January 2000
WBS 1.4 - Beam Transport Systems($K)

Project Number 96-D-111
Janaury 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	1,993	312	1,993	312	1,681	84%	90,764	90,764
Nov-99	8,070	5,793	10,063	6,106	3,957	39%	90,764	90,764
Dec-99	8,070	5,116	18,133	11,222	6,912	38%	90,764	90,764
Jan-00	8,070	3,928	26,203	15,150	11,054	42%	90,764	90,764
Feb-00	8,070		34,273				90,764	
Mar-00	8,070		42,344				90,764	
Apr-00	8,070		50,414				90,764	
May-00	8,070		58,484				90,764	
Jun-00	8,070		66,554				90,764	
Jul-00	8,070		74,624				90,764	
Aug-00	8,070		82,694				90,764	
Sep-00	8,070		90,764				90,764	



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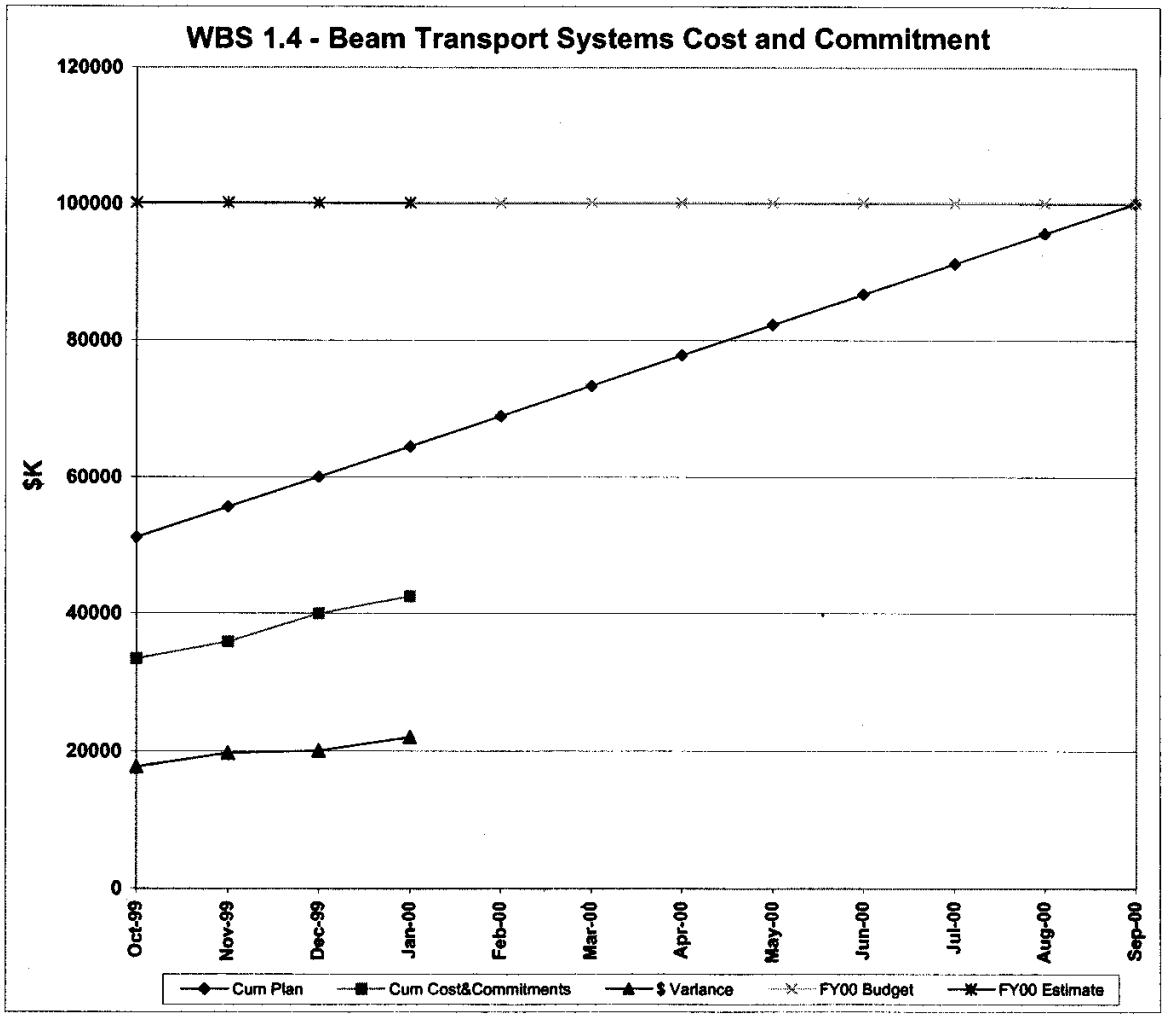
FY2000 Cost and Commitment Plan to Actual
as of January 2000
WBS 1.4 - BeamTransport Systems ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	51,134 *	33,394	51,134 *	33,394	17,740	35%	100,106	100,106
Nov-99	4,452	2,457	55,586	35,850	19,736	36%	100,106	100,106
Dec-99	4,452	4,109	60,038	39,960	20,078	33%	100,106	100,106
Jan-00	4,452	2,535	64,490	42,495	21,995	34%	100,106	100,106
Feb-00	4,452		68,942				100,106	
Mar-00	4,452		73,394				100,106	
Apr-00	4,452		77,846				100,106	
May-00	4,452		82,298				100,106	
Jun-00	4,452		86,750				100,106	
Jul-00	4,452		91,202				100,106	
Aug-00	4,452		95,654				100,106	
Sep-00	4,452		100,106				100,106	



* Includes $34,782K of uncosted obligations from FY99.

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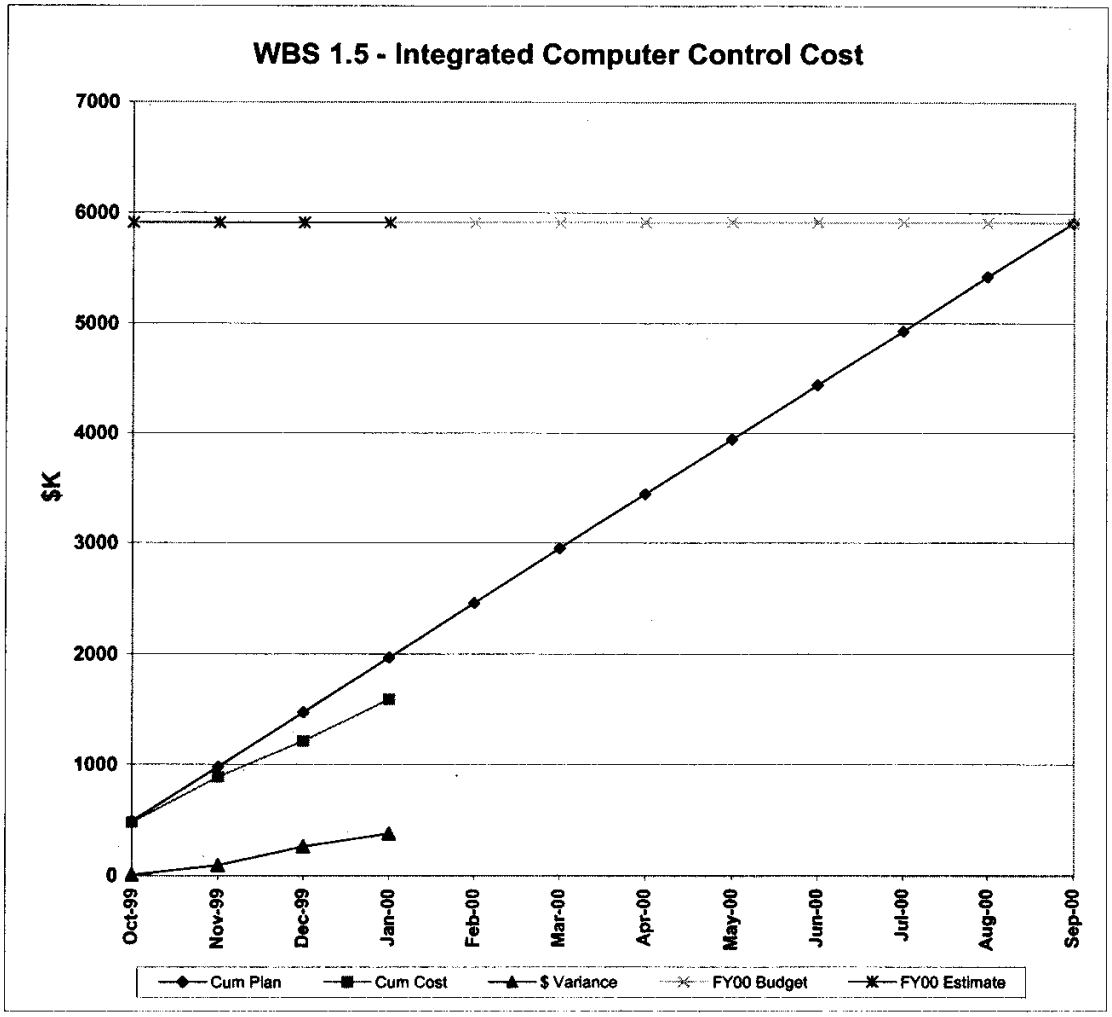
FY2000 Cost Plan to Actual
as of January 2000
WBS 1.5 - Integrated Computer Control ($K)

Project Number 96-D-111
Janaury 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	489	482	489	482	7	1%	5,914	5,914
Nov-99	493	407	982	889	93	10%	5,914	5,914
Dec-99	493	328	1,475	1,217	258	17%	5,914	5,914
Jan-00	493	374	1,969	1,591	377	19%	5,914	5,914
Feb-00	493		2,462				5,914	
Mar-00	493		2,955				5,914	
Apr-00	493		3,448				5,914	
May-00	493		3,941				5,914	
Jun-00	493		4,435				5,914	
Jul-00	493		4,928				5,914	
Aug-00	493		5,421				5,914	
Sep-00	493		5,914				5,914	



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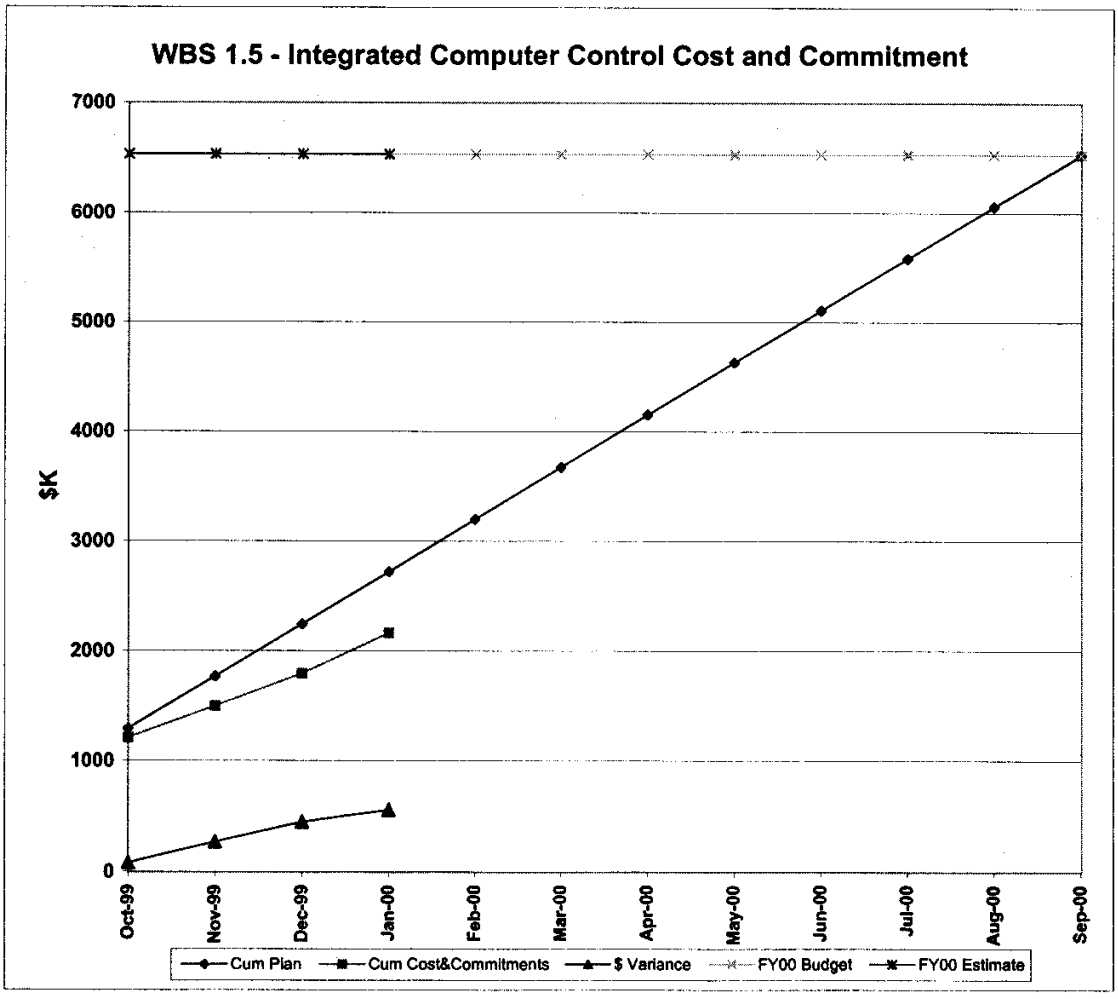
FY2000 Cost and Commitment Plan to Actual
as of January 2000
WBS 1.5 - Integrated
Computer Control ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	1,294 *	1,211	1,294 *	1,211	83	6%	6,536	6,536
Nov-99	477	287	1,771	1,498	273	15%	6,536	6,536
Dec-99	477	299	2,247	1,797	450	20%	6,536	6,536
Jan-00	477	369	2,724	2,166	557	20%	6,536	6,536
Feb-00	477		3,200				6,536	
Mar-00	477		3,677				6,536	
Apr-00	477		4,153				6,536	
May-00	477		4,630				6,536	
Jun-00	477		5,106				6,536	
Jul-00	477		5,583				6,536	
Aug-00	477		6,059				6,536	
Sep-00	477		6,536				6,536	



* Includes $750K of uncosted obligations from FY99.

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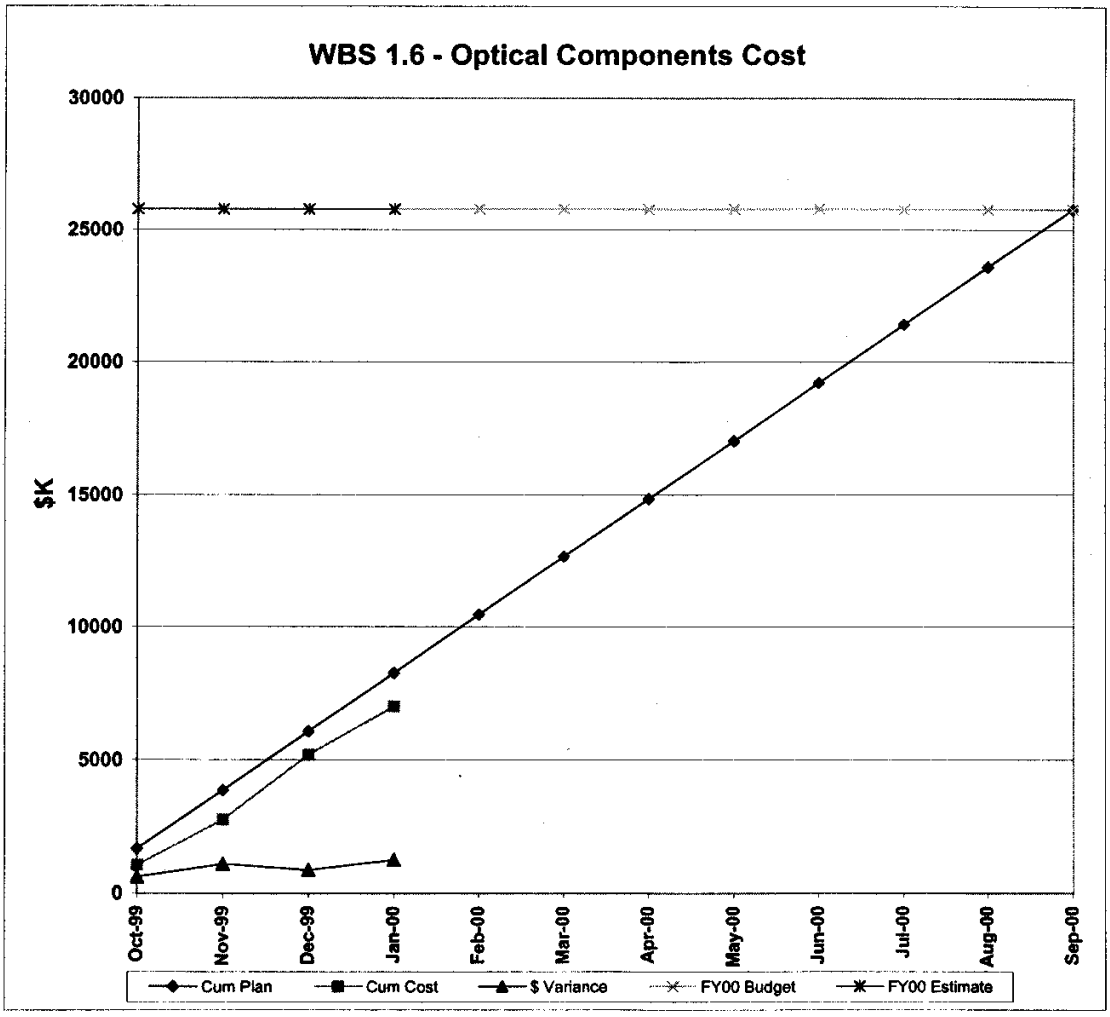
FY2000 Cost Plan to Actual
as of Janaury 2000
WBS 1.6 - Optical Components ($K)

Project Number 96-D-111
Janaury 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	1,681	1,067	1,681	1,067	614	37%	25,798	25,798
Nov-99	2,192	1,704	3,873	2,771	1,102	28%	25,798	25,798
Dec-99	2,193	2,422	6,066	5,193	873	14%	25,798	25,798
Jan-00	2,193	1,810	8,258	7,003	1,255	15%	25,798	25,798
Feb-00	2,193		10,451				25,798	
Mar-00	2,193		12,643				25,798	
Apr-00	2,193		14,836				25,798	
May-00	2,193		17,028				25,798	
Jun-00	2,193		19,221				25,798	
Jul-00	2,193		21,413				25,798	
Aug-00	2,193		23,606				25,798	
Sep-00	2,193		25,798				25,798	



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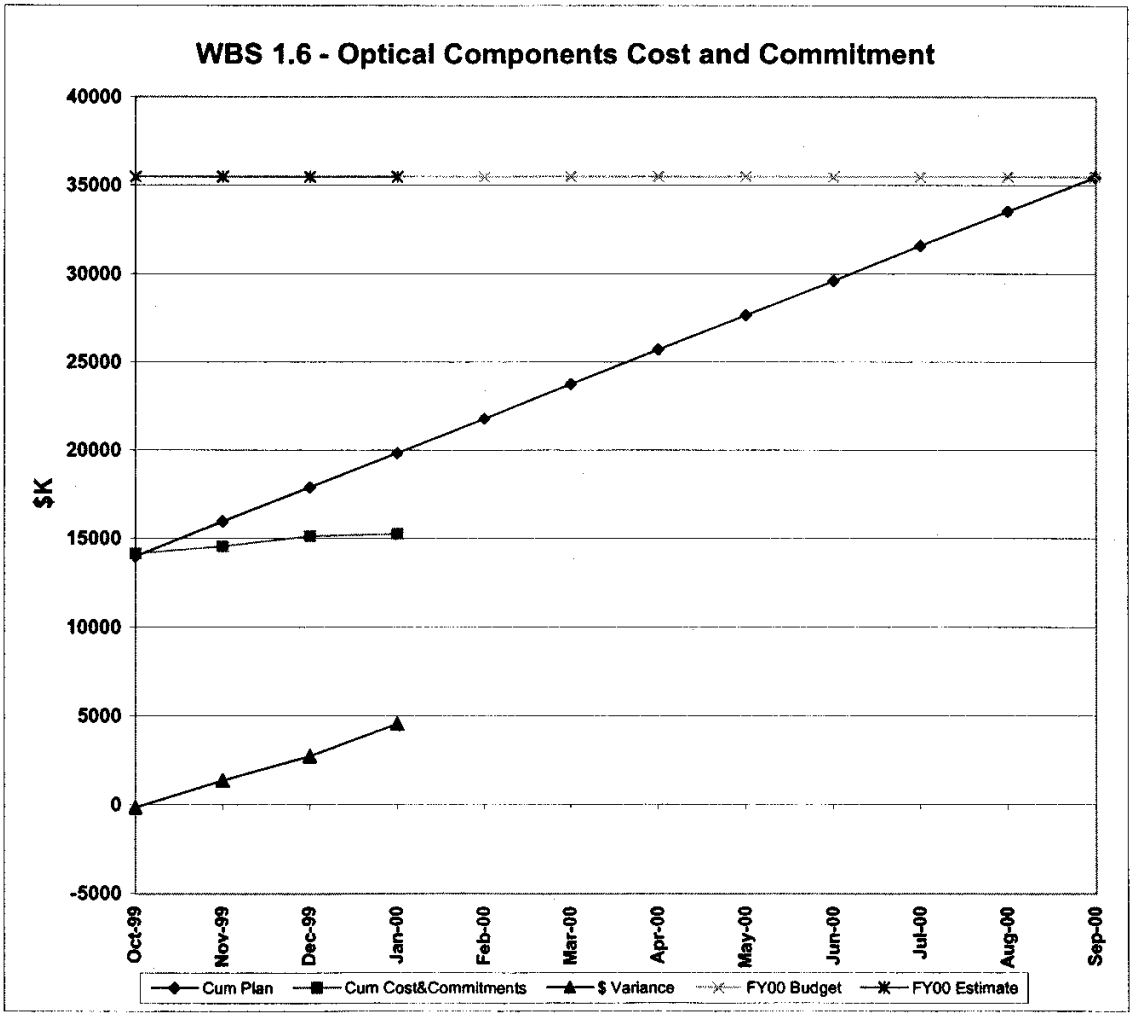
FY2000 Cost and Commitment Plan to Actual
as of January 2000
WBS 1.6 - Optical Components ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	13,984 *	14,124	13,984 *	14,124	-140	-1%	35,473	35,473
Nov-99	1,954	441	15,938	14,565	1,373	9%	35,473	35,473
Dec-99	1,954	570	17,891	15,135	2,756	15%	35,473	35,473
Jan-00	1,954	131	19,845	15,266	4,579	23%	35,473	35,473
Feb-00	1,954		21,798				35,473	
Mar-00	1,954		23,752				35,473	
Apr-00	1,954		25,705				35,473	
May-00	1,954		27,659				35,473	
Jun-00	1,954		29,612				35,473	
Jul-00	1,954		31,566				35,473	
Aug-00	1,954		33,519				35,473	
Sep-00	1,954		35,473				35,473	



* Includes $12,620K of uncosted obligations from FY99.

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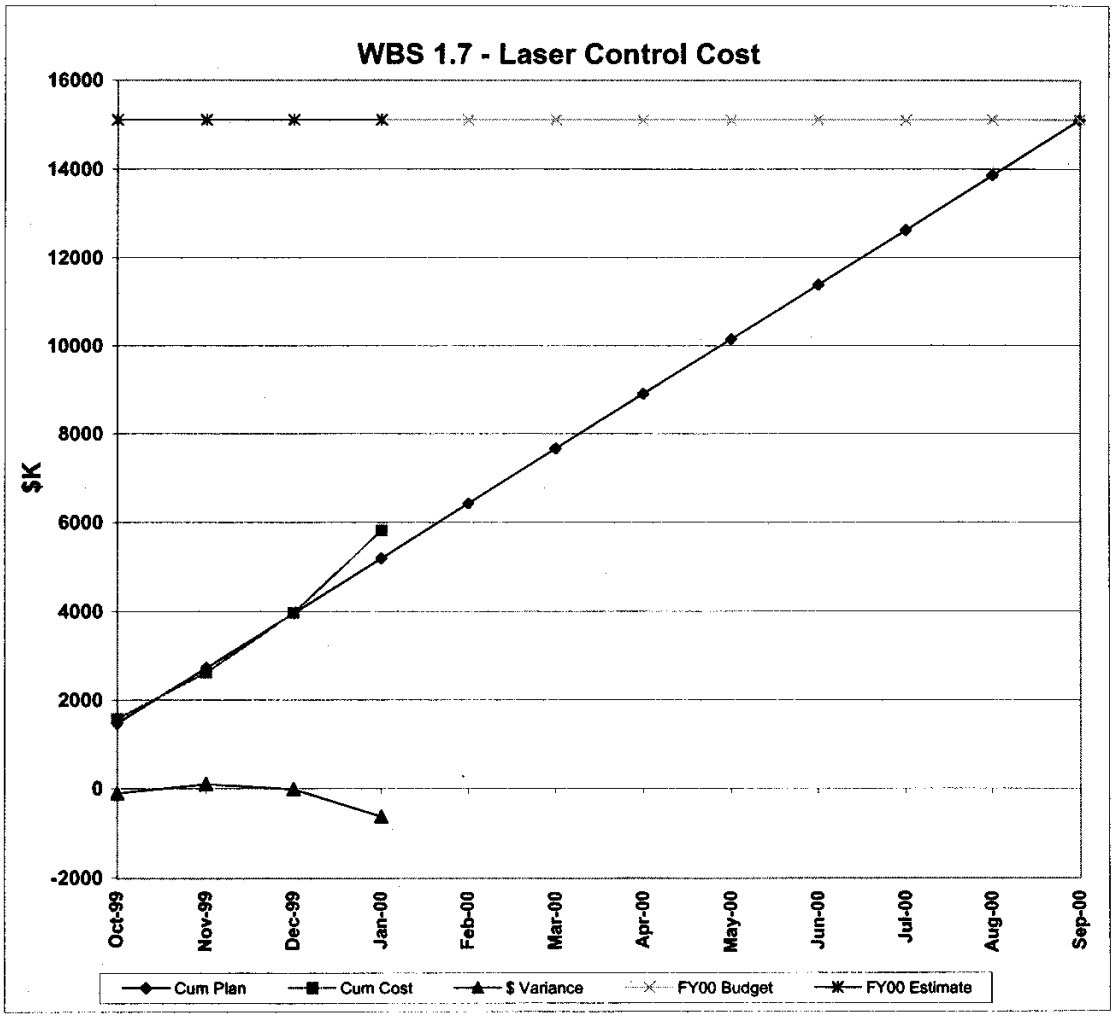
FY2000 Cost Plan to Actual as of January 2000
WBS 1.7 - Laser Control ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	1,483	1,582	1,483	1,582	-99	-7%	15,103	15,103
Nov-99	1,238	1,042	2,721	2,625	97	4%	15,103	15,103
Dec-99	1,238	1,351	3,959	3,976	-17	0%	15,103	15,103
Jan-00	1,238	1,851	5,198	5,827	-629	-12%	15,103	15,103
Feb-00	1,238		6,436				15,103	
Mar-00	1,238		7,674				15,103	
Apr-00	1,238		8,912				15,103	
May-00	1,238		10,150				15,103	
Jun-00	1,238		11,389				15,103	
Jul-00	1,238		12,627				15,103	
Aug-00	1,238		13,865				15,103	
Sep-00	1,238		15,103				15,103	



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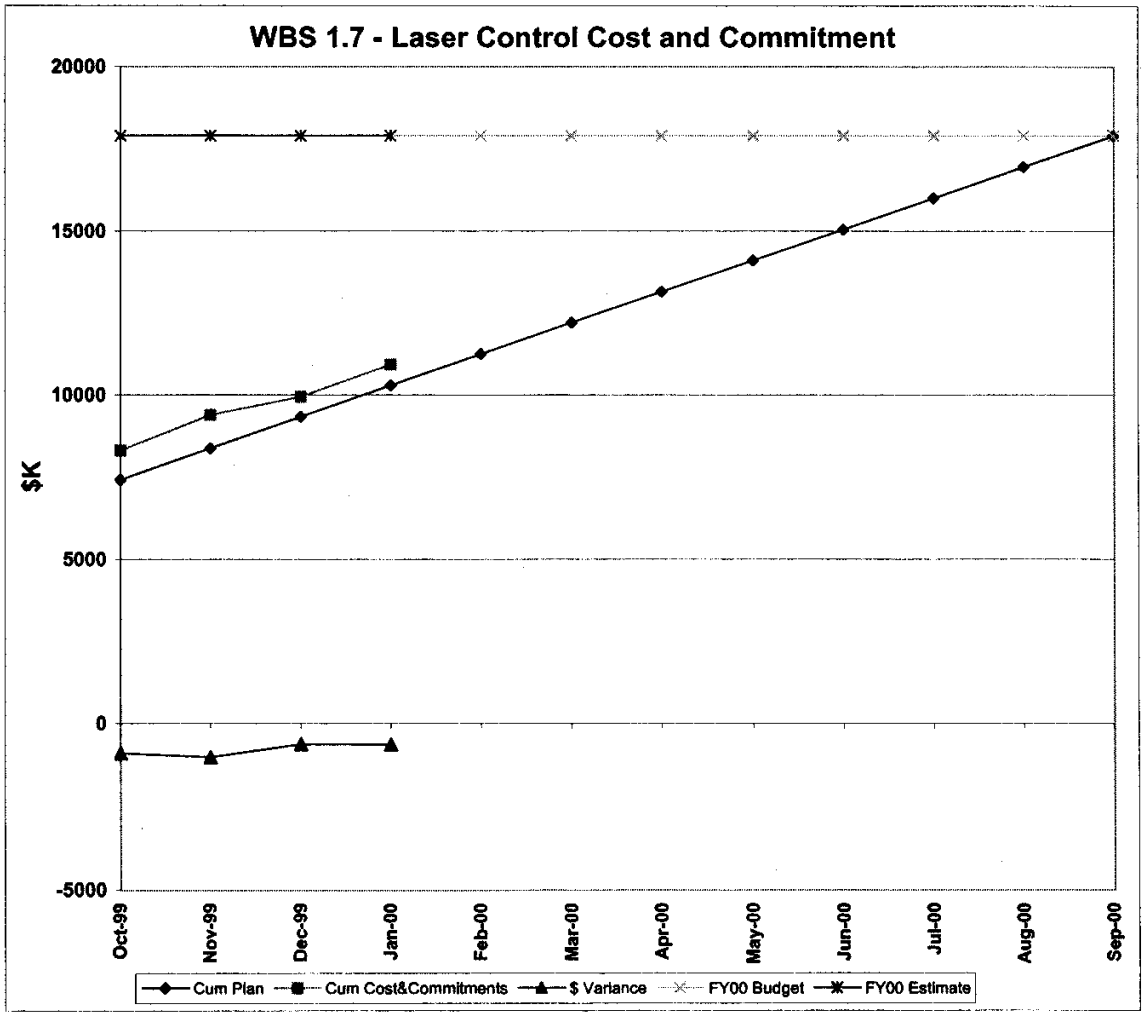
FY2000 Cost and Commitment Plan to Actual
as of January 2000
WBS 1.7 - Laser Control ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	7,429 *	8,309	7,429 *	8,309	-880	-12%	17,914	17,914
Nov-99	953	1,089	8,382	9,398	-1,016	-12%	17,914	17,914
Dec-99	953	544	9,335	9,942	-607	-6%	17,914	17,914
Jan-00	953	982	10,289	10,924	-636	-6%	17,914	17,914
Feb-00	953		11,242				17,914	
Mar-00	953		12,195				17,914	
Apr-00	953		13,148				17,914	
May-00	953		14,101				17,914	
Jun-00	953		15,055				17,914	
Jul-00	953		16,008				17,914	
Aug-00	953		16,961				17,914	
Sep-00	953		17,914				17,914	



* Includes $4,136K of uncosted obligations from FY99.

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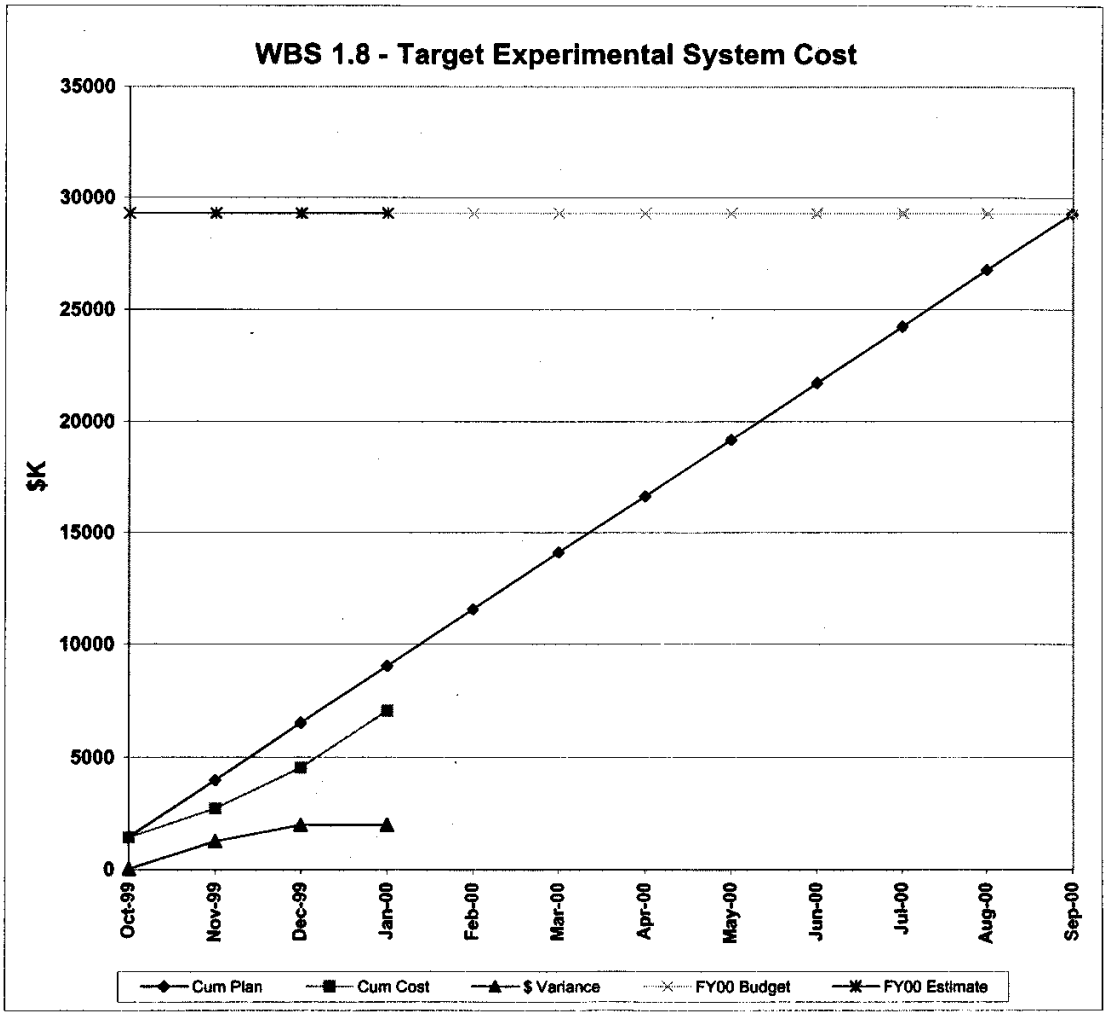
FY2000 Cost Plan to Actual
as of January 2000
WBS 1.8 - Target Experimental System ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	1,458	1,429	1,458	1,429	29	2%	29,303	29,303
Nov-99	2,531	1,296	3,989	2,725	1,264	32%	29,303	29,303
Dec-99	2,531	1,806	6,521	4,531	1,990	31%	29,303	29,303
Jan-00	2,531	2,521	9,052	7,052	2,000	22%	29,303	29,303
Feb-00	2,531		11,584				29,303	
Mar-00	2,531		14,115				29,303	
Apr-00	2,531		16,646				29,303	
May-00	2,531		19,178				29,303	
Jun-00	2,531		21,709				29,303	
Jul-00	2,531		24,241				29,303	
Aug-00	2,531		26,772				29,303	
Sep-00	2,531		29,303				29,303	



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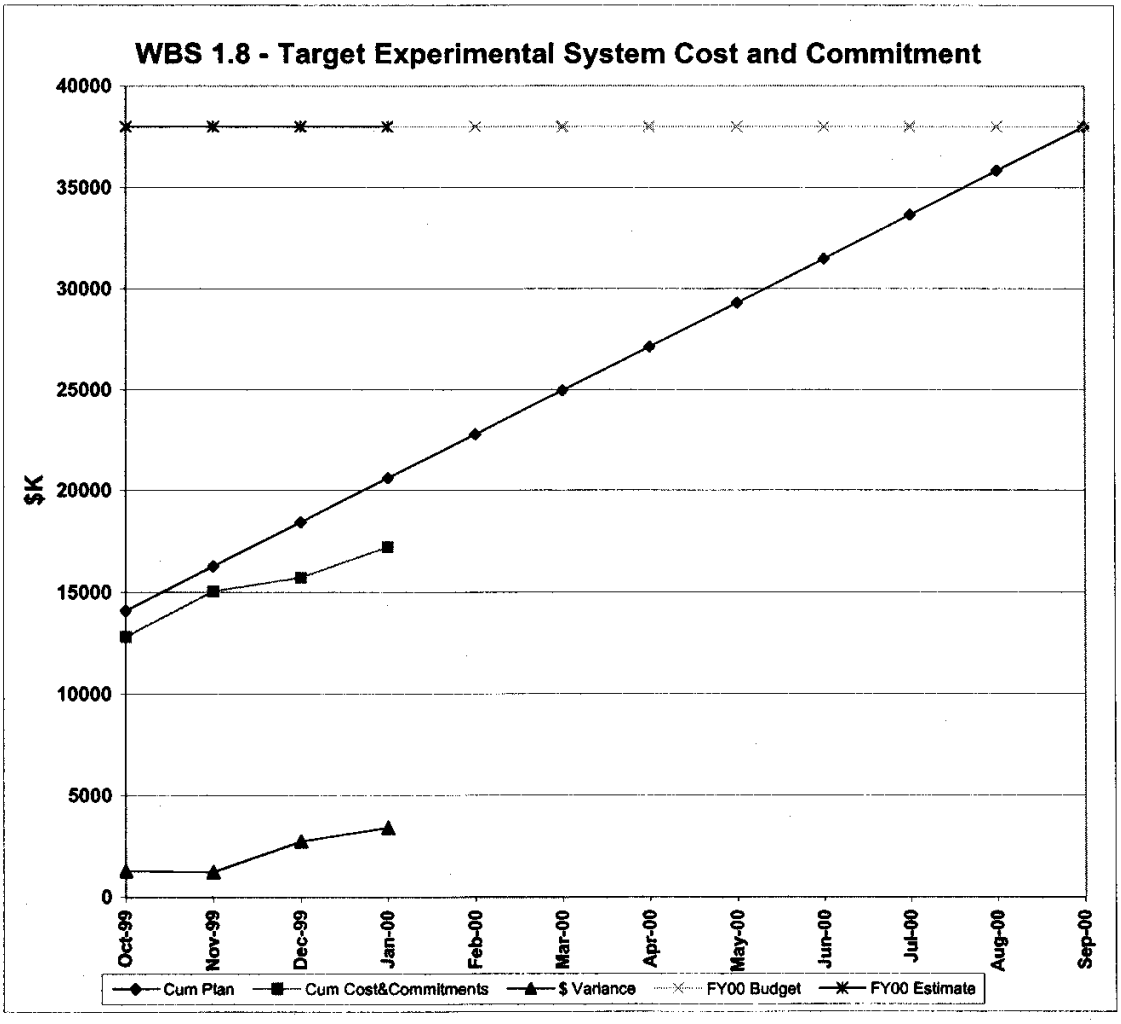
FY2000 Cost and Commitment Plan to Actual as of January 2000
WBS 1.8 - Target Experimental System ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	14,093 *	12,805	14,093 *	12,805	1,288	9%	38,008	38,008
Nov-99	2,174	2,246	16,267	15,050	1,217	7%	38,008	38,008
Dec-99	2,174	670	18,441	15,720	2,721	15%	38,008	38,008
Jan-00	2,174	1,496	20,615	17,216	3,399	16%	38,008	38,008
Feb-00	2,174		22,789				38,008	
Mar-00	2,174		24,964				38,008	
Apr-00	2,174		27,138				38,008	
May-00	2,174		29,312				38,008	
Jun-00	2,174		31,486				38,008	
Jul-00	2,174		33,660				38,008	
Aug-00	2,174		35,834				38,008	
Sep-00	2,174		38,008				38,008	



* Includes $6,252K of uncosted obligations from FY99.

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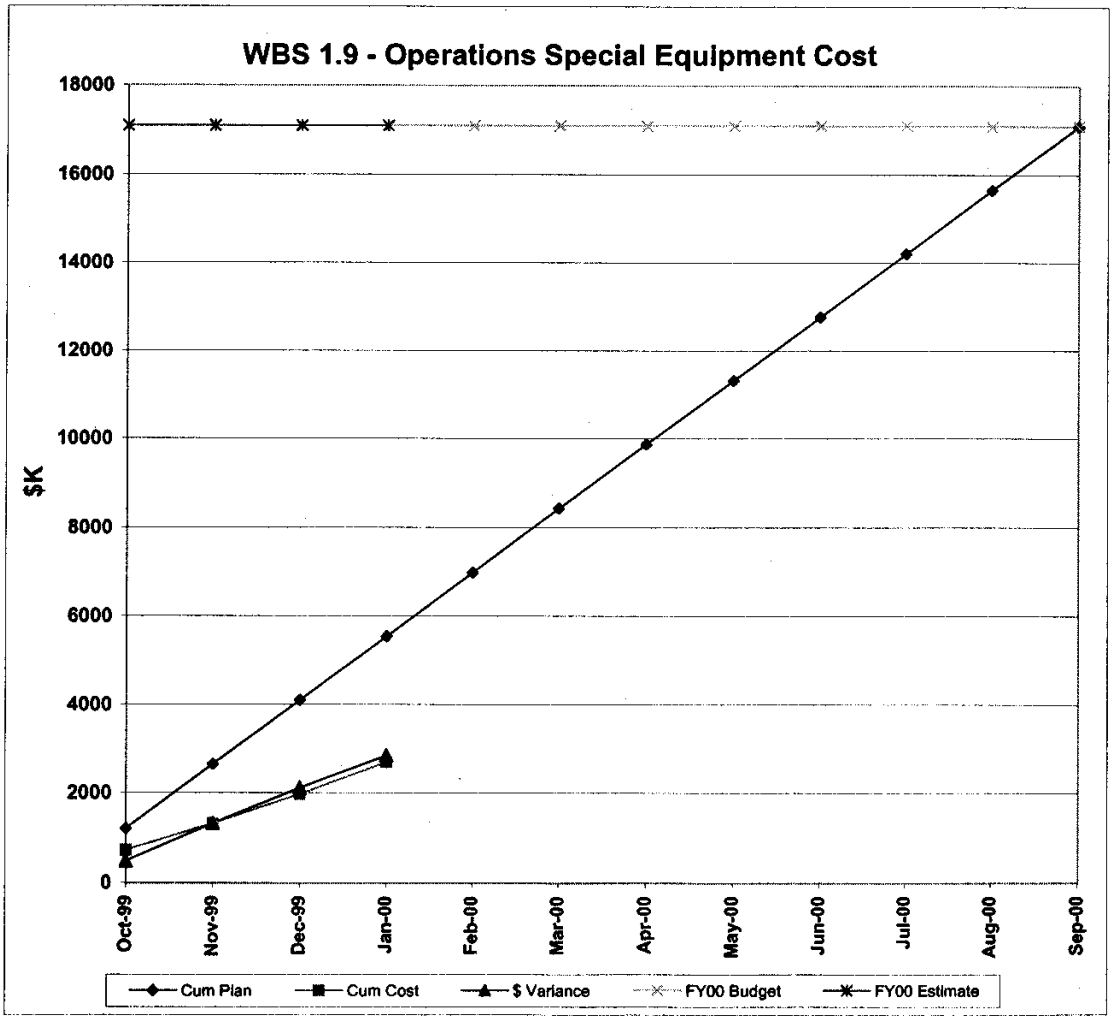
FY2000 Cost Plan to Actual
as of January 2000
WBS 1.9 - Operations Special Equipment ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	1,209	728	1,209	728	481	40%	17,091	17,091
Nov-99	1,444	601	2,653	1,329	1,324	50%	17,091	17,091
Dec-99	1,444	653	4,097	1,982	2,115	52%	17,091	17,091
Jan-00	1,444	716	5,540	2,698	2,843	51%	17,091	17,091
Feb-00	1,444		6,984				17,091	
Mar-00	1,444		8,428				17,091	
Apr-00	1,444		9,872				17,091	
May-00	1,444		11,316				17,091	
Jun-00	1,444		12,759				17,091	
Jul-00	1,444		14,203				17,091	
Aug-00	1,444		15,647				17,091	
Sep-00	1,444		17,091				17,091	



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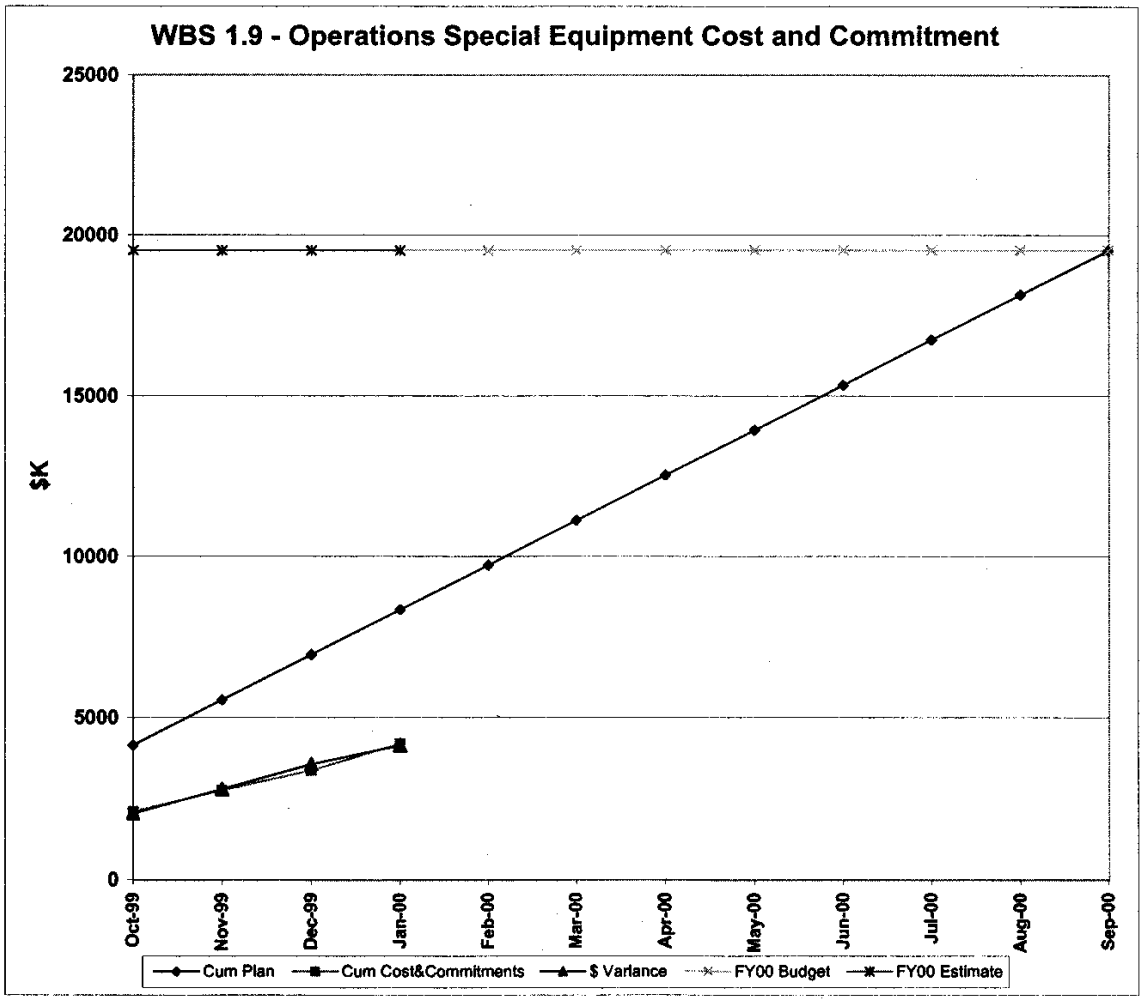
FY2000 Cost and Commitment Plan to Actual
as of January 2000
WBS 1.9 - Operations
Special Equipment ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	4,144 *	2,102	4,144 *	2,102	2,042	49%	19,537	19,537
Nov-99	1,399	657	5,543	2,759	2,784	50%	19,537	19,537
Dec-99	1,399	618	6,943	3,377	3,566	51%	19,537	19,537
Jan-00	1,399	817	8,342	4,194	4,148	50%	19,537	19,537
Feb-00	1,399		9,742				19,537	
Mar-00	1,399		11,141				19,537	
Apr-00	1,399		12,540				19,537	
May-00	1,399		13,940				19,537	
Jun-00	1,399		15,339				19,537	
Jul-00	1,399		16,739				19,537	
Aug-00	1,399		18,138				19,537	
Sep-00	1,399		19,537				19,537	



* Includes $1,404K of uncosted obligations from FY99.

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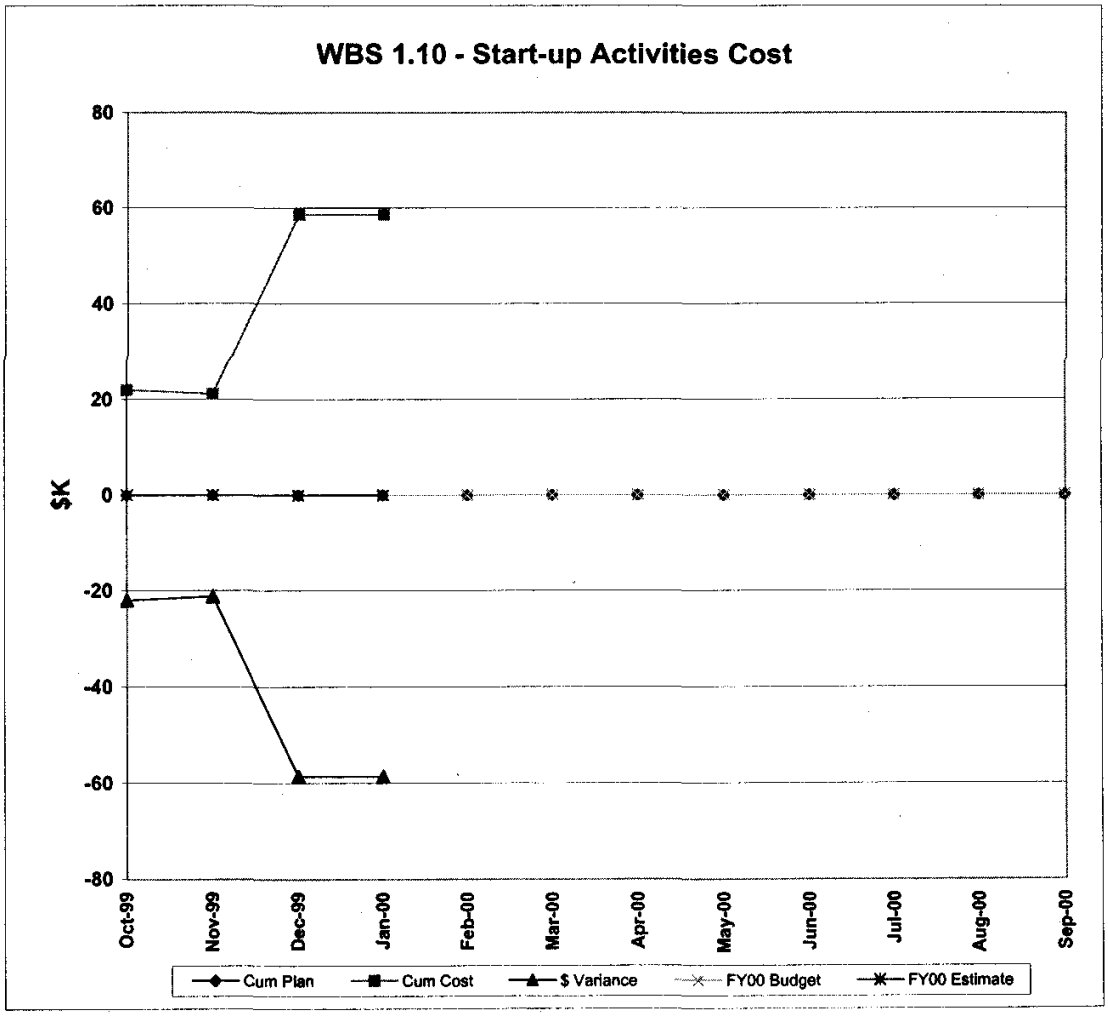
FY2000 Cost Plan to Actual
as of January 2000
WBS 1.10 - Start-up Activities ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned*	Actual	Planned	Actual	$ Var	% Var	Budget*	Estimate
Oct-99	0	22	0	22	-22	#DIV/0!	0	0
Nov-99	0	-1	0	21	-21	#DIV/0!	0	0
Dec-99	0	37	0	59	-59	#DIV/0!	0	0
Jan-00	0	0	0	59	-59	#DIV/0!	0	0
Feb-00	0		0				0	
Mar-00	0		0				0	
Apr-00	0		0				0	
May-00	0		0				0	
Jun-00	0		0				0	
Jul-00	0		0				0	
Aug-00	0		0				0	
Sep-00	0		0				0	



* Plan will be prepared and budgeted.

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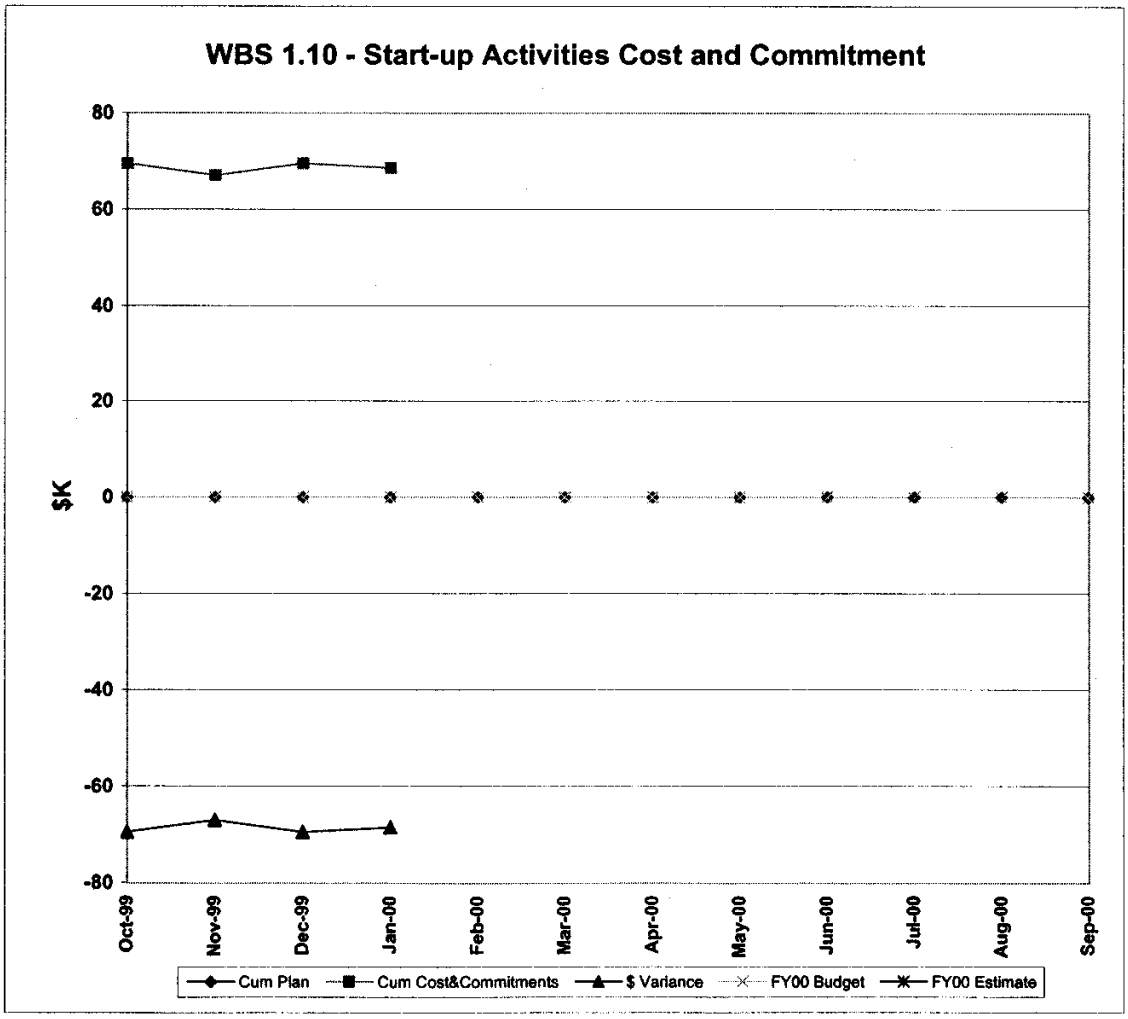
FY2000 Cost and Commitment Plan to Actual as of January 2000
WBS 1.10 - Start-up Activities ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned*	Actual	Planned	Actual	$ Var	% Var	Budget*	Estimate
Oct-99	0	70	0	70	-70	#DIV/0!	0	0
Nov-99	0	-2	0	67	-67	#DIV/0!	0	0
Dec-99	0	3	0	70	-70	#DIV/0!	0	0
Jan-00	0	-1	0	69	-69	#DIV/0!	0	0
Feb-00	0		0				0	
Mar-00	0		0				0	
Apr-00	0		0				0	
May-00	0		0				0	
Jun-00	0		0				0	
Jul-00	0		0				0	
Aug-00	0		0				0	
Sep-00	0		0				0	



* Plan will be prepared and budgeted.

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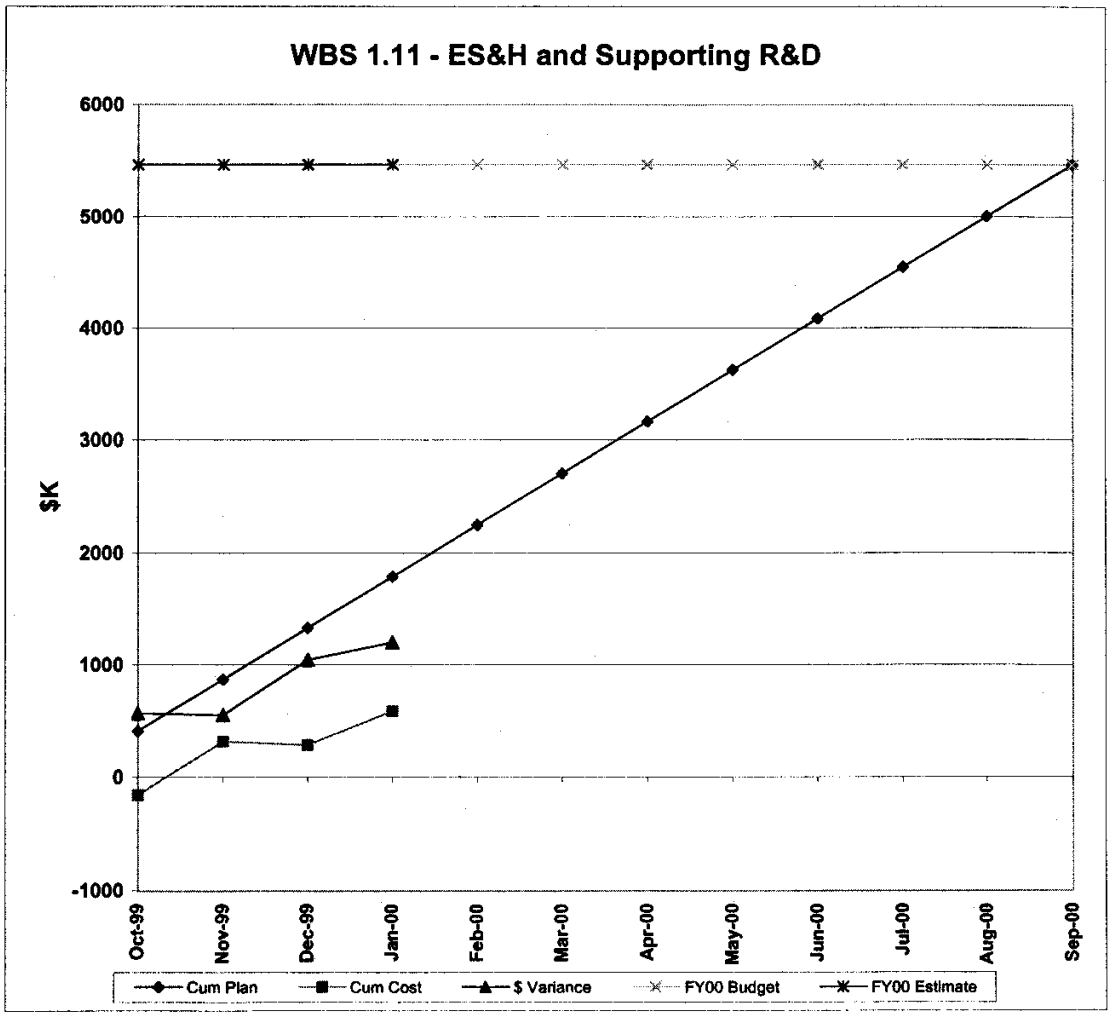
FY2000 Cost Plan to Actual
as of January 2000
WBS 1.11 ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	410	-157	410	-157	567	138%	5,466	5,466
Nov-99	460	474	870	317	553	64%	5,466	5,466
Dec-99	460	-33	1,329	284	1,046	79%	5,466	5,466
Jan-00	460	306	1,789	589	1,200	67%	5,466	5,466
Feb-00	460		2,248				5,466	
Mar-00	460		2,708				5,466	
Apr-00	460		3,168				5,466	
May-00	460		3,627				5,466	
Jun-00	460		4,087				5,466	
Jul-00	460		4,546				5,466	
Aug-00	460		5,006				5,466	
Sep-00	460		5,466				5,466	



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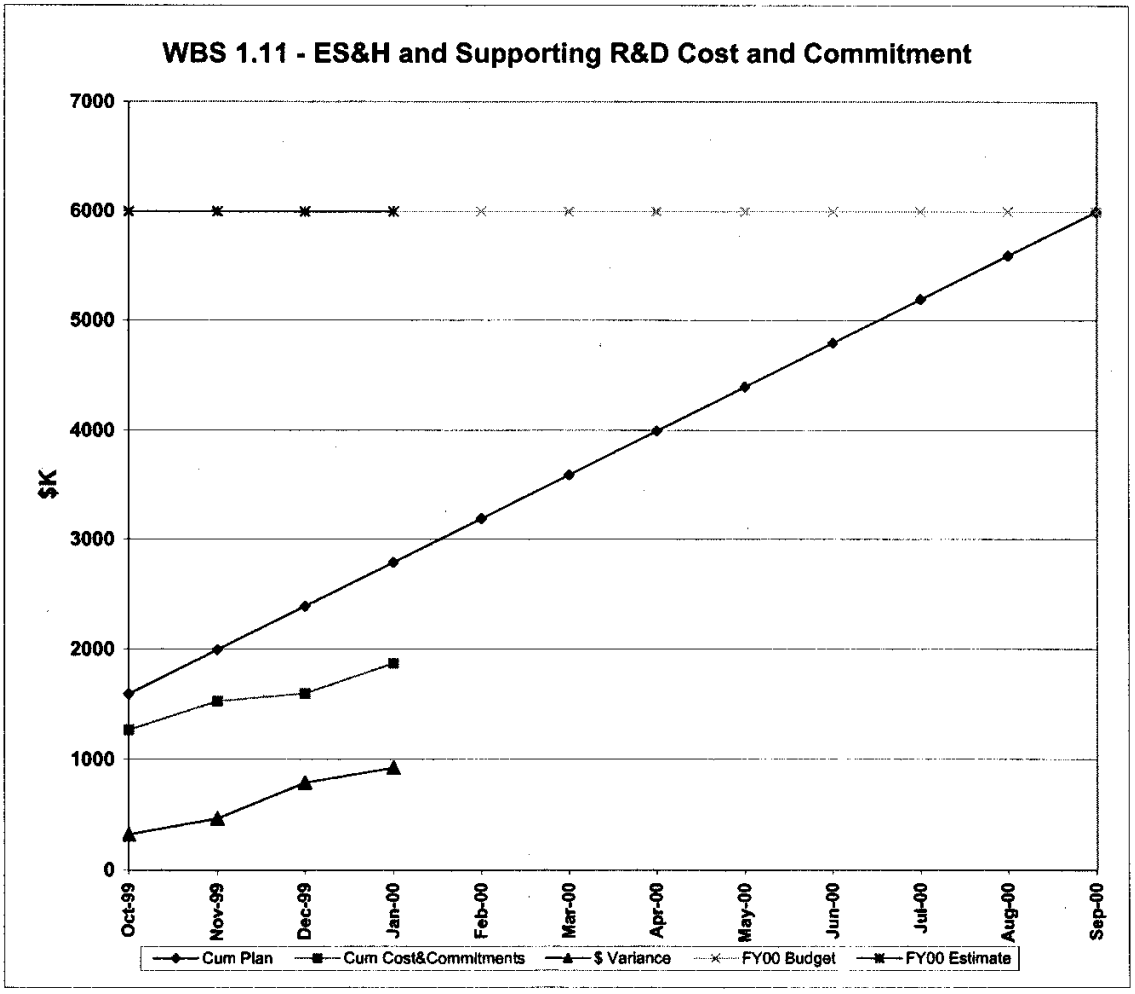
FY2000 Cost and Commitment Plan to Actual
as of January 2000
WBS 1.11 ($K)

Project Number 96-D-111
January 2000

	Monthly		Cumulative				FY2000	FY2000
Month	Planned	Actual	Planned	Actual	$ Var	% Var	Budget	Estimate
Oct-99	1,592 *	1,269	1,592 *	1,269	323	20%	5,993	5,993
Nov-99	400	256	1,992	1,525	467	23%	5,993	5,993
Dec-99	400	73	2,392	1,598	794	33%	5,993	5,993
Jan-00	400	271	2,792	1,869	923	33%	5,993	5,993
Feb-00	400		3,192				5,993	
Mar-00	400		3,593				5,993	
Apr-00	400		3,993				5,993	
May-00	400		4,393				5,993	
Jun-00	400		4,793				5,993	
Jul-00	400		5,193				5,993	
Aug-00	400		5,593				5,993	
Sep-00	400		5,993				5,993	



* includes $1,423K of uncosted obligations from FY99.

FY00 NIF Contingency Log - as of January 2000 ($BA)

Request #	Month	WBS element	Total	Contingency*
Oct-99	BCP00-002	1.2.2.1	$ 725,200	$ 29,948,388
	CTR319	1.8.7	$ 65,000	$ 29,883,388
	CTR323	1.2.2.4.9	$ 185,000	$ 29,698,388
	ECR1072	1.4.1	$ 26,800	$ 29,671,588
	ECR1120	1.4.1.3	$ 28,800	$ 29,642,788
		1.4.3.2	$ 67,200	$ 29,575,588
	ECR1124	1.3.2.6	$ 3,700	$ 29,571,888
	ECR410	1.4.1.2	$ 468,000	$ 29,103,888
		1.4.4.1	$ (683,200)	$ 29,787,088
Nov-99	BCP00-005	1.3.4	$ (1,812,000)	$ 31,599,088
	BCP00-007	1.2.2.1	$ 100,000	$ 31,499,088
		1.2.2.4.9	$ 1,200,000	$ 30,299,088
	BCP00-008	1.3.2	$ 846,000	$ 29,453,088
	BCP00-009	1.3.2	$ 2,389,600	$ 27,063,488
	CTR324	1.2.2.4.6	$ 100,000	$ 26,963,488
	CTR325	1.2.2.4.4	$ 76,000	$ 26,887,488
	CTR327	1.3.2	$ 195,000	$ 26,692,488
	CTR328	1.2.2.4.6	$ 118,000	$ 26,574,488
	CTR330	1.4.3.1	$ 375,000	$ 26,199,488
	CTR331	1.2.2.4.9	$ 198,000	$ 26,001,488
	ECR1166	1.9.2	$ 5,000	$ 25,996,488
Dec-99	BCP00-010	1.4.5.1	$ 800,000	$ 25,196,488
	CTR332	1.2.2.4.9	$ 250,000	$ 24,946,488
	CTR336	1.2.2.4.6	$ 156,000	$ 24,790,488
	CTR338	1.2.2.4.5	$ 108,000	$ 24,682,488
	CTR340	1.2.2.4.6	$ 133,000	$ 24,549,488
	ECR1275	1.4.4	$ 250,000	$ 24,299,488
		1.8.4	$ 250,000	$ 24,049,488
Jan-00	BCP00-003	1.8.7.5	$ 518,200	$ 23,531,288
	BCP00-004	1.1.5	$ 362,500	$ 23,168,788
		1.4.1.2	*$ 100,000*	*$ 23,068,788*
		1.5.4.1	$ 10,000	$ 23,058,788
		1.7.1.4	$ 95,000	$ 22,963,788
	BCP00-006	1.4.2.4	$ 609,000	$ 22,354,788
	CTR344	1.4.4.2	$ 311,000	$ 22,043,788
	ECR1316	1.2.2.1	$ 20,000	$ 22,023,788
		1.2.2.4.9	$ 15,000	$ 22,008,788
	ECR1356	1.4.1.3	$ 69,000	$ 21,939,788
	ECR1357	1.4.1.3	$ 94,900	$ 21,844,888
	ECR1364	1.3.2	$ 4,000	$ 21,840,888

* Remaining Contingency as a % of cost remaining will be reported when the rebaselining is complete and revised BAC/EAC is established and approved.

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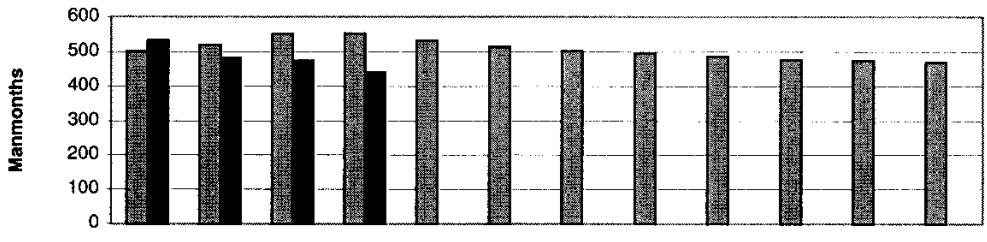
FY00 - Manpower Plan to Actual by Month*
(LLNL and Supplemental Labor Manmonths)



	Oct-99	Nov-99	Dec-99	Jan-00	Feb-00	Mar-00	Apr-00	May-00	Jun-00	Jul-00	Aug-00	Sep-00
Plan	501	519	550	553	533	515	502	497	487	476	473	468
Actual	533	482	474	440	0	0	0	0	0	0	0	0

* FY00 manpower plan will be in draft until the rebaselining effort is complete and the FY00 Cost Account Plans are approved.